THE IRON TRADE REVIEW

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Cold Weather Has Chilling Effect on Business

But Improvement at Early Date is Expected—Good Prospect for Railroad Buying—Structural Material Prices Cut

The iron trade is longing for milder weather. The prolonged and intensely cold weather, which has extended to nearly all parts of the country, has had a depressing effect on business, putting a stop to outside work in new construction and seriously interfering with the movement of trains. Improvement is expected as soon as the weather moderates. There is reason for believing that there will be active car and rail buying in the near future and that probably 15,000 cars and 100,000 tons of rails will shortly be inquired for. Some leading systems which have bought cars will place supplemental orders. The American Steel & Wire Co. and other manufacturing concerns report scarcity of cars. The International & Great Northern, a Texas railroad, has inquired for 15,000 tons of open-hearth rails.

The last idle Gary furnace has been blown in and the rail mill will start Feb. 26, thus putting the Gary plant in full operation.

Wire and Sheets

The American Steel & Wire Co. now has on its books the largest tonnage, by a substantial margin, of any time in its history. Specifications against wire contracts are very satisfactory and some sales are being made at the new quotations. Sheets are showing irregularity and some of the independent companies are eager to dispose of their stocks on hand. Tin plate prices are fairly firm and an optimistic sentiment prevails.

Pig Iron

The pig iron market is quiet, but the tendency is toward greater firmness. In the south, stocks have decreased and the $10 quotation on No. 2 foundry had narrowed to a few brands. In the valleys, consumers of basic are urging prompt deliveries and the limited sales made indicate that the price is $12.40, valley. On No. 2 foundry, $13.25, valley, seems to be pretty well established. In the east, the market is dull, but several good inquiries have appeared in the Philadelphia district within a few days, including one for 5,000 tons of low phosphorus and one for 2,000 tons of basic. Additional sales of from 4,000 to 5,000 tons of southern iron have been made for shipment to Genoa, Italy. A New Jersey pipe maker, which recently made a purchase, has taken 5,000 tons additional from eastern Pennsylvania furnaces. Reports of low prices in New England are still prevailing.

Structural Material

Softness in prices of structural material has been more strongly in evidence within a few days, particularly in eastern territory, where several contracts have been closed at or below $40 per ton, delivered. The American Bridge Co. has taken 3,000 tons for section No. 3 of the Lexington avenue subway, New York City; 1,200 tons for the Stetson building, Philadelphia, and will probably receive the contract for the Manufacturers' Club, Philadelphia, 2,300 tons, and 2,000 tons for the stock exchange of that city. The American Bridge Co. also has taken 1,554 tons for the construction of bins at the Duluth plant of the Minnesota Steel Co. The Eastern Steel Co. has 1,000 tons for a high school in Brooklyn. The Riter-Conley Mfg. Co., Pittsburgh, has taken a contract for from 600 to 800 tons for new construction for the General Electric Co., at Erie, Pa. The general contract for the Western Union building, New York, which will require 10,000 tons of steel, has been awarded to Marc Eidlitz & Son.

Railroad Buying

Railroad buying has been confined, to a large extent, to the Chicago district, although the Pittsburgh district has taken some fair orders. The Santa Fe railroad has ordered 5,000 tons of shapes and the Pennsylvania railroad, 1,500 tons, from the American Bridge Co. The Spokane, Portland & Seattle has contracted for 2,350 tons from the Pennsylvania Steel Co. The Illinois Steel Co. now has a fair accumulation of rail orders. The Southern railroad has ordered 300 freight cars and 200 steel underframes from the Mt. Vernon Car Mfg. Co. The Canadian Pacific is taking prices on 600 side-dump ballast cars. The St. Paul will build 1,000 box cars and 500 refrigerator cars in its own shops. The Wabash is in the market for 2,950 freight cars and 20 passenger coaches. A southern railroad has ordered 80 gondolas from the Pressed Steel Car Co.

WORLD'S IRON MARKETS

Pittsburgh

Heavy Production Continues. — New Business Light.

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., Feb. 13.

Despite the fact that the pig iron market has remained dull almost to lifelessness, furnace operations in the Pittsburgh district have increased, and production on a heavy scale is being maintained steadily, with shipments corresponding to a large extent to the output. Absence of any considerable buying is not shown in the attitude of the furnace interests, for prices hold fairly firm in face of the show of dullness. Semi-finished steel demand continues at a high rate of production and consumption, the bulk of which is going into the lighter finished lines, and prices are firm. The heavy demand for plates and shapes on orders in the hands of makers has been unbroken and mills are well supplied with bookings for some months, but new business is not appearing yet, except in tentative form and this has caused some interests anxious to secure a share of the business going, to offer inducements. Slightly better showing is made in the tin plate trade, where orders are being placed more freely and a better tone is noted in the transactions. What weakness has been developing in this line, it is believed will have been effectually checked by the appearance of the usual spring contracts covering a large volume of business. Railroads generally are buying freely of equipment or are preparing to do so, as indicated by the inquiries for fair sized lots of cars and bridge material. Rail orders, while not appreciably increased during the past week, are continuing fair, with a sprinkling of export business among those taken. Light rails are improved in a demand of a broad character and a general stiffening of prices has been noted. The extreme cold weather has had the effect of curtailing the production of coke, especially furnace coke, and has also inconvenienced the furnace operators. Frozen ore piles and ice coated coke piles have made it difficult to maintain more than a moderate production. There is more figuring on structural orders and a few were awarded to makers during the week. Merchant pipe continues among the more active lines, but oil country goods are less active mainly because of the prevailing conditions in the oil fields discouraging any new construction work. This situation will likely continue until more open weather prevails. Reports of shading on bars and plate material by eastern makers, are believed to have been misunderstood, as prices offered for business by those producers were for eastern buyers only and were based on 1.10c, Pittsburgh, making about 1.26c to point of delivery, thus showing merely a division of the freight benefits of the producers in securing desired business. Fabricators are generally busy estimating on new work, but as yet their efforts are not effective in bringing out any important lettings.

Pig Iron.—The pig iron market last week was confined to small sales at unchanged prices, foundry iron showing better than the other grades, in point of demand. Orders are being confined today to carload lots of 200 and 300 tons. Prices are being held at $13.25, valley, for No. 2 foundry, and a fair amount of malleable and gray forge in similar lots was closed at unchanged prices. Two thousand tons of basic for Ohio delivery, went to an adjacent furnace to the consuming point at a price which would average about $12.40, valley, and 500 to another interest. This was for first half delivery. Bessemer sales are extremely scarce, the market apparently being inanimate. No sales beyond a few carload lots are being reported, and prices are held unchanged at $14 to $14.25, valley. In spite of trade being light, furnace operations continue remarkably heavy, the leading interest adding an additional stack to its active list at Niles, O., and having 51 out of 59 furnaces active. Three of these furnaces, however, are running on manganese. We quote the market as follows.

(Prompt Shipment.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	15.15
Basic, valley	12.40
Basic, Pittsburgh	13.30
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.90

(First Quarter.)

Bessemer, valley	$14.00
Bessemer, Pittsburgh	15.15
Basic, valley	12.40
Basic, Pittsburgh	13.30
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.90

Ferro-Alloys.—The market for ferro-manganese and ferro-silicon continues extremely quiet. Consumers have largely covered for the first half of the year on their present basis of operations. Buying continues only in small lots, with no change in price. Fifty per cent ferro-silicon is steady, and the lower grades of domestic continue weak.

We quote ferro-manganese nominally at $41, Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $70, Pittsburgh, for prompt and forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—The production of plates is principally against existing contracts, and mills are operating at practically their full capacity, but new business is not large, and attractive orders will induce some shading of the ruling quotation, 1.15c, Pittsburgh. Eastern mills, which are lacking in business, not being filled up to the same extent as the local producers, have been accepting a fair amount of business at 1.10c, Pittsburgh, for the eastern market. New car orders are lacking, inquiries being comparatively few. The Pressed Steel Car Co. received one order for 80 steel gondolas of 140,000 pounds capacity for a southern road. No action has been taken by either the Western Maryland or the Bessemer & Lake Erie on their requirements amounting to over 4,000 cars, but announcement is expected in a short time. Two fair-sized orders for plates are included in contracts for gas holders, placed with a local fabricators this week, one for a 750,000-cubic foot gas holder to be erected at East Braintree, Mass., for J. D. Shattuck, and another 3,000,000-cubic foot gas holder for the Philadelphia Suburban Gas & Electric Co.

Inquiry is also out for a small tonnage of ship plates for a Toledo ship building concern, to be used in the construction of two vessels under contract there. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.10 to 1.15c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets. — Specifications on sheets against existing contracts are continuing at a rate that promises to make February exceed January in the matter of production. Some independent mills are feeling the lack of new orders, and are accepting new business at a shade below the market price for both black and galvanized products. New orders were placed in this district in the past week for black sheets at 1.85c and for galvanized at 2.85c, and while not large, indicated the sentiment of the smaller producers. The same interest, however, declined contracts for forward delivery at anything below the market. It should have been stated last week that the leading interest in sheets reported shipments only for January this year, as exceeding any January in its history. We quote the market as follows, with $1 a ton added as the delivered price in the Pittsburgh district:

Blue annealed sheets No. 10 gage, 1.40c; black annealed sheets No. 28 gage, 1.85 to 1.90c; galvanized sheets, No. 28 gage, 2.85 to 2.90c; painted roofing sheets, $1.35 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.45 per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburgh.

Tin Plates.—The tin plate market continues above normal for February, and while mills just now could take care of a larger tonnage, there is a generally optimistic feeling regarding the immediate future, which gives a stiffer backbone to those who have been less favored in the way of current business. Prices hold fairly firm. Some reports of shading on spot orders to $3.35 are unquestionably true, but the larger independents are operating practically to capacity, and are declining all offers below the $3.40 base. The canners' convention at Rochester, N. Y., last week, is believed to portend a larger volume of plate business during the present year, than in any previous period. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.35 to $3.40 f. o. b. mill, Pittsburgh district.

Rails and Track Material. — While new business in the rail market has been confined to small orders during the past week, it is said that the larger buyers of standard section rails are coming to a conclusion on their specifications, and mills are getting more liberal orders against contracts than a week ago. A fair tonnage is coming from export markets largely confined to open-hearth rails, which better meet the requirements of the foreign roads. In the light rail market, greater activity has been shown. Inquiries are more general than for some time. The satisfactory condition of the coal and coke industry as well as in the lumber operations, has brought a number of very active orders out during the week, and the sugar planters have been showing a renewed interest in the light rail supplies. Prices are firm and remain unchanged. The demand for track material is still rather quiet, owing to the unfavorable weather for carrying on any improvements. The market is quoted as follows, the base price on open-hearth steel rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9-16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅝	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅜	.60
2 x ⅜	.80

Steel.—The market for semi-finished steel continues active and strong. Independent producers are becoming well supplied with business and prices for billets are firm at $20, Pittsburgh. Sheet bars are also in heavy demand, and the production is practically taken for Pittsburgh mills for some time ahead, so that additional tonnage is going mainly to Youngstown and other adjacent points. Consumers are specifying steadily against contracts, and there is some backwardness in meeting these orders. Forging billets are held at $28, with a fair inquiry. Billets and sheet bars are quoted as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20, with the usual extras for size and analysis, and open-hearth rolling billets, $20, Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $21 f. o. b. Pittsburgh or Youngstown, with full freight to destination added. Forging billets are quoted at $28, Pittsburgh.

Hoops and Bands. — The heavy specifications against contracts for hoops and bands continues, and February shipments thus far exceed January by a wide margin. There is no change in the market price, but little new business has appeared. We quote the market as follows:

Hoops in carload lots, 1.25c to 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands, 1.15c, base, with net extras, as per standard steel.

Merchant Bars. — While most bar mills are fairly well supplied with orders, there is a disposition to shade 1.15c, Pittsburgh, on desirable new business. Some has been done at 1.10c during the past week. The leading interest appears to be disposed to reject the offers below the market unless under very exceptional conditions. The demand for shafting since the first of February has been quiet, and contract buying is very dull. Specifying against orders has been below January, buyers, as a rule, appearing to have covered for immediate requirements in December. As a rule, the market is inactive, with the normal prices unchanged. We quote the market as follows:

Common iron bars, 1.35c, Pittsburgh; Bessemer and open-hearth steel bars, 1.15c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—The market continues very quiet for muck bar. Inquiries are few, as buyers have apparently covered for their immediate requirements, and are not disposed to enter the market for the next 30 days. Prices remain nominally $28 to $29, Pittsburgh.

Structural. — The actual business done in structural material is not heavy thus far during February, and there is believed to have been considerable effort at securing orders by large interests east of Pittsburgh, by shading prices, but only for prompt deliveries. Eastern mills have taken considerable tonnage at 1.10c, Pittsburgh. The local producers are not doing business on this basis, as they are fairly well filled up, and the leading interest could not well care for any considerable new tonnage for two or three months. More or less speculation is aroused by the placing of the order for the Hell-Gate bridge, with estimates at 1.10c for the 40,000 tons of steel required, and this has been used as an argument for shading the market, but this figure is believed to be somewhat below the actual price, although this great order included special fea-

tures that permit a lower cost of production. Among the orders placed for structurals in the past week were 300 tons of steel for extensions and additions for the Aluminum Co. of America at New Kensington, Pa., and 1,000 tons for the new plant for the Eastman Kodak Co., Rochester, N. Y. These were placed with a Pittsburgh fabricator. The Pennsylvania Railroad Co. has also awarded an order for 1,500 tons of bridge material for Lawrence Junction, Pa., to the American Bridge Co., and the General Electric Co. has placed an order for from 600 to 800 tons with the Riter-Conley Manufacturing Co., Pittsburgh, for its plant at Erie, Pa. Considerable figuring is being done on new work, and small orders are reported to be fairly numerous, but owing to the severe weather, the market remains rather inactive for immediate requirements. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.15c to 1.20c; tees, 1.15c to 1.20c; angles, from 3 to 6 inches, 1.15c to 1.20c; over 6 inches, 1.25c; universal and sheared 1.15c to 1.20c; over 15 inches, 1.25c to 1.30c, plates, 6¼ inches wide and wider, 1.25c.

Merchant Pipe.—Merchant pipe demand is above normal for this season, the high rate of production continuing with heavy specifications against contracts. The leading interest reports a gain in the first month's business of the year that is beyond expectations. There has been a fair amount of new business for line pipe appearing in the market. A contract for 25 miles of 12-inch steel pipe, Ohio delivery, has been placed, while inquiry for 25 miles of 16-inch has been withdrawn, and the buyer is arranging specifications for 60 miles of 12-inch in place of the original inquiry. There are some new inquiries for western shipment, while a number of smaller orders for both line pipe and merchant pipe are very fair. We quote the following official discounts to jobbers subject to the usual preferential discount to the larger buyers:

Iron and Steel Pipe Basing Prices

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	74	54	68	48
⅜ inch	75	65	69	59
½ inch	78	68	72	62
¾ to 1½ inch	81	73	75	67
2 to 3 inches	82	75	76	69
	Lap weld.			
2 inches	79	72	72	65
2½ to 4 inches	81	74	74	67
4½ to 6 inches	80	72	73	65
7 to 12 inches	77	68	71	61
13 to 15 inches	55	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ⅜ inch	70	60	65	55
½ inch	75	69	70	64
¾ to 1½ inch	79	73	74	68
2 to 3 inches	80	74	75	69
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	65
2½ to 4 inches	81	74	74	67
4½ to 6 inches	77	71	72	66
7 to 8 inches	70	60	65	55
9 to 12 inches	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	54
¾ to 1½ inch	68	62	63	57
2 to 3 inches	70	64	65	59
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	55
2½ to 4 inches	68	62	63	57
4½ to 6 inches	67	61	62	56
7 to 8 inches	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price.)

Boiler Tubes.—There is a slightly improved demand for boiler tubes and mills are running on better schedule, but could easily take care of additional business. Buyers are specifying somewhat more actively against contracts. Prices are steady, and indications point to a slightly more active market for locomotive tubes. The official discounts on steel and charcoal iron boiler tubes follow:

Steel:

1¾ to 2¼ inch	65
2½ inch	67½
2¾ to 3¼ inch	72
3½ to 4½ inch	75
5 and 6 inch	67½
7 to 13 inch	65

Charcoal Iron:

1½ inch	48
1¾ to 2¼ inch	50
2½ inch	55
2¾ to 5 inch	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—Orders for wire and wire nails are continuing to run heavy, but the specifications are against existing contracts placed at the 1.50c base, and will continue so until the end of the month. On that date, the 1.55c base will rule for the next succeeding 30 days. The leading interest, as well as the principal jobbing interest are stocking up for the spring, and a portion of the present large production is for warehouse stocks. The leading interest and larger independents are operating to capacity. Buying at the 1.60c base has been quiet, and producers do not expect much on the new list until later in the spring. The demand for cut nails is steady but unchanged. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60; retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—There is a good market for wire rods. Mills are running to capacity, on specifications against existing contracts, taken on the former base of $25.50, Pittsburgh. It would be difficult to place new orders at the lower quotation today however, and the larger producers of wire rods are declining to accept new tonnage below $26 for forward delivery. We quote $25.50 to $26, Pittsburgh, for Bessemer and open-hearth wire rods.

Coke.—Foundry coke is in good demand. Consumers apparently have very little stock on hand, and are dependent upon steady shipments from the ovens. Prices are firm and the market conditions satisfactory to consumers. The increase in furnace operation in Pittsburgh territory, together with the severe weather, has pulled rather heavily on the coke operators for meeting their requirements, especially for spot coke. Shipments were very large while production fell off more than 40,000 tons last week compared with the previous week. This decrease was entirely with the furnace ovens. Their actual loss was 42,846 tons. The merchant ovens, on the other hand, gained over 2,000 tons. Producers were unable to maintain their running time, and with the snow and ice and difficulty railroads have in moving shipments held down production to a lower tonnage than for some weeks. Prices are steady. We quote standard Connellsville furnace coke for prompt shipment from $1.80 to $1.90 ovens. On high grade Connellsville foundry coke, we quote $2.25 to $2.40 ovens for prompt shipment, and also on contract. The Connellsville Courier for the week ending Feb. 3, shows 38,995 active ovens with a production of 360,153 tons as compared with 38,995 active ovens with a production of 400,000 tons for the previous week.

Old Material. — The market for scrap is dull, as most of the larger consumers are covered for immediate requirements. Little business is going, and the prices show a weakening effect on several grades. Bundled sheet scrap showed a reduction of 50 cents, being now quoted at $10.50 to $11. No. 1 wrought scrap also shows a decline of 50 cents, being now quoted at $12.50 to $13. Old car wheels show a like reduction at $12.50 to $13. Shipments on orders are moving slowly. We quote gross tons delivered in the

Pittsburgh district, including Monessen, Steubenville, Brackenridge and Follansbee as follows:

Heavy melting scrap	$12.25 to 12.75
Rerolling rails	12.75 to 13.00
Malleable	12.00 to 12.50
Bundled, sheet scrap	10.50 to 11.00
Iron axles	21.50 to 22.00
Old iron rails	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.50 to 13.00
Low phosphorus	15.00 to 15.50
Machine shop turnings	9.25 to 9.75
Cast borings	9.00 to 9.25
No. 1 cast scrap	12.50 to 12.75

Chicago

Unfilled Orders on Mill Books Are Decreasing.

Office of THE IRON TRADE REVIEW, 1328 Monadnock Block, Feb. 13.

There has been no falling off in specifications in the west so far in February, although it is undeniable that shipments are now exceeding new orders and unfilled tonnage on the mill books is decreasing. This situation should not cause any alarm because it is not conceivable that buying could keep up continuously at the rate which existed during the latter part of December and January. One of the leading steel makers in this district received new orders in January double those in December and the latter month was considerably in excess of what is considered normal.

The American Bridge Co. has taken 5,000 tons from the Santa Fe for various bridges and also 1,554 tons from the Minnesota Steel Co. for ore bins. The Pennsylvania Steel Co. has contracted to deliver 2,350 tons of bridge material to the Spokane, Portland & Seattle Railway. On plates and structurals, the western market is somewhat easier, the minimum quotation being 1.28c, Chicago.

Pig Iron.—Inquiry for northern iron is better than that for southern, but no large lots of either are under consideration at the present time. A Chicago maker of pipe fittings has purchased 600 tons of 8 per cent silicon iron at $17.40 delivered, according to reliable reports. Prices on high silicon iron are stiffening to some extent, and several interests are asking $15.50 at the furnace for 8 per cent iron, although the transaction mentioned above indicates that it is yet possible to obtain iron on a basis of $15 at the furnace. Southern producers continue in their firm attitude toward prices and as a result are doing practically no business in the immediate Chicago district and only small tonnages have been sold recently for shipment to outside western territory. A local radiator manufacturer is understood to be in the market for 1,000 tons of northern foundry iron for delivery at one of its Ohio plants. A Rockford, Ill., foundry is inquiring for 200 tons of Southern No. 2 and a Benton Harbor, Mich., shop is in the market for 300 tons of southern.

The following prices represent the market for Chicago delivery, except northern foundry and malleable Bessemer made in local furnaces, which are quoted f. o. b. furnace.

(First Half Shipment.)

Lake Superior charcoal	$16.50
Northern foundry No. 2	14.00
Southern foundry No. 2	14.85
Southern silveries, 5 per cent silicon	15.60
Jackson Co. silveries, 8 per cent	17.40
Malleable Bessemer	14.00
Alabama basic	14.85

Billets.—Specifications thus far in February are equaling the January rate and prices are fairly firm. We continue to quote, f. o. b. Chicago, open-hearth forging billets, $26; rerolling billets, $22.50.

Merchant Bars.—Certain independent manufacturers report that their specifications for the first ten days in February are equal to one-half of the total specifications received in January. The majority of the eastern mills represented in this market are not accepting below 1.15c, Pittsburgh, on steel bars, except on desirable specifications. The local market, however, is unchanged at from 1.25c to 1.33c. The agricultural implement makers are behind on their specifications but are ordering more freely just at present in expectation of a fair amount of second order business. The general opinion seems to be that March, April and May will be good months and that considerable new business will appear. There is a moderate demand for shafting and prices are apparently firm. Iron and steel is moving out of stock freely. The bar iron situation shows no special change. One maker recently accepted a heavy railroad contract at 1.15c, Chicago.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.15c to 1.20c; hard steel bars, rerolled, 1.15c to 1.20c; soft steel bars, bands and small shapes, 1.25c to 1.33c, base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 60 per cent off list for carload lots, 55 per cent off for less than carloads.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.50c to 1.60c per pound base; soft steel bars, 1.50c to 1.60c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material. — Fabricating contracts continue heavy and the amount of railroad buying is encouraging. In spite of a fairly good tonnage outlook, prices are a little soft and fabricators are able to get 1.10c, Pittsburgh, on business which is satisfactory to the mills. The American Bridge Co. has a contract from the Santa Fe railroad for 5,000 tons of bridge material and has also taken 1,554 tons from the Minnesota Steel Co. for ore bins and limestone bins, with coke pockets, for the blast furnaces at the new Duluth plant. The American Bridge Co. has also taken 240 tons from the Twin City Rapid Transit Co. for stack supports. The Spokane, Portland & Seattle railway has let 2,350 tons for various bridge spans to the Pennsylvania Steel Co. The Barnett & Record Co. will erect a reinforced concrete cleaning house for Konrad Schrier, Sheboygan, Wis., for which 176 tons of steel will be required. Other fabricating contracts reported in the western market are as follows: A printing building for the Franklin Co., Chicago, 604 tons, let to Hansel-Elcock; the Garland building, Los Angeles, Cal., 992 tons, let to Milliken Bros.; a steel headframe for the Bristol mine of the Bristol Mining Co., Crystal Falls, Mich., 130 tons, to the Wisconsin Bridge & Iron Co., and the Chicago Business College, Chicago, 556 tons, to the Modern Steel Structural Co.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.28c to 1.33c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 to $1.65 per 100 pounds; angles over 6 inches, $1.70 to $1.75 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds, base; channels, 3 inches and larger, $1.60 per 100 pounds, base.

Rails and Track Supplies.—The Illinois Steel Co. now has a fair accumulation of rail orders and the Gary mill will probably start before the end of the month. There was no additional rail business placed, however, during the past week. The receivers of the Wabash, having been authorized to issue $10,000,000 in receivers' certificates, expect to buy 15,000 tons of standard rails in the near future. There is very little other business in sight. Orders for light rails are poor and the makers are shading prices at points where competition is keen. Specifications for track supplies continue in good volume.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c

to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.50c to 1.55c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.90c base.

Plates.—The market on plates is now quotable at 1.28 to 1.33c, Chicago, and competition from eastern mills is a little more noticeable. The Mt. Vernor Car Mfg. Co. has an order for 300 freight cars and 200 steel underframes from the Southern railway, which line is also said to be in the market for 18 passenger cars. The Canadian Pacific is taking prices on 600 side-dump ballast cars. The Chicago, Milwaukee & St. Paul will build 1,000 box cars and 500 refrigerator cars in its own shops. The Nebraska-Northwestern, Davenport, Ia., is in the market for 14 cars. The Cudahy Packing Co., Chicago, has ordered 350 steel underframe cars from the Haskell & Barker Car Co. The Wabash is in the market for 1,000 40-ton steel underframe, 36-foot and 40-foot stock cars; 1,000 steel underframe, 36-foot, 40-ton box cars; 750 40-foot, 40-ton automobile cars, 200 50-ton all-steel hopper cars and 20 passenger coaches.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.28c to 1.33c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.60c.

Sheets.—An effort is being made by makers in this district to obtain better prices on galvanized sheets. It is pointed out that galvanized sheets are lower in proportion than any other light steel product. The market, however, is not quotably higher and plenty of tonnage is available at 2.03c, Chicago, for black, and 3.03c for No. 28 galvanized. The tonnage holds up fairly well.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.90c; No. 12, 1.95c. Box annealed, No. 28, 2.30c. Galvanized, No. 28, 3.35c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—Specifications on wire, both for industrial and agricultural purposes, and also nails, are very satisfactory. The resumption of building operations has improved the demand for nails. The mills are anticipating a good spring business.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—There is very little change in the pipe and tube market in the west. Jobbers are ordering pipe slowly. The demand for boiler tubes is fairly good, especially from stock.

We quote, store prices on merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	66.2	55.2
½ inch to 1½ inch.	78.2	69.2	71.2	62.2
Lap.				
2 inch	76.2	68.2	68.2	60.2
4½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch...	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
4½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes.

	Lap weld Per cent. steel.	Charcoal Iron. Per cent. iron.	Shelby Per cent. seamless.
1 inch	39	..	57½
1¼ to 2¼ inch.....	55	40	35
2¾ to 3¼ inch.....	65	50	46
3½ to 4½ inch.....	67½	50	46
5 to 6 inch.....	55	..	..

Cast Iron Pipe.—The prices of cast iron pipe are very firm and in some cases makers are obtaining advances. Bids will be opened at Newcastle, Ind., on Feb. 19, for 3,500 tons of cast iron water pipe. The city of Altamont, Ill., will be in the market about May 1 for a considerable tonnage of pipe.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—The market remains weak and the volume of business is very light. Some No. 2 wrought has recently been purchased in this market at $10. There has been so little business lately that prices have shown only narrow fluctuations and the market is not quotably lower, generally speaking, in spite of the pressure which has been exerted. There have been no railroad lists of consequence issued recently.

We quote, for delivery in consumers' yards, as follows:

GROSS TONS.	
Old car wheels	$13.00 to 13.50
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.25 to 12.75
Old steel rails (3 ft. and under)	11.75 to 12.25
Frogs, switches and guards	10.50 to 11.00
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50
NET TONS.	
No. 1 R. R. wrought	$10.75 to 11.25
No. 2 R. R. wrought	9.75 to 10.25
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	13.50 to 14.00
Iron car axles	18.00 to 18.50
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers' forge	8.75 to 9.25
Pipe and flues	8.00 to 8.50
No. 1 cast	11.00 to 11.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.00 to 6.50
Machine shop turnings	6.50 to 7.00
Railroad malleable	10.50 to 11.00
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.50 to 13.00
Angle bars, steel	9.75 to 11.25
Stove plate and light cast scrap	9.25 to 9.75

Cleveland

Bethlehem Inquiry for Ore.—Corrigan, McKinney & Co. Will Continue in Foundry Trade.

Office of THE IRON TRADE REVIEW, Penton Bldg., Feb. 13.

Iron Ore.—The inquiry of the Bethlehem Steel Co., referred to last week, was for 200,000 tons of ore a year for 10 years. The inquiry has not been received very seriously by iron ore sellers, and there seems to be no immediate prospect of a contract being made. Some additional sales have been made of small lots without prices being definitely stated. Reports that a well known ore had been sold at a reduction of 50 cents a ton are officially denied. Owners of old range ores state that a reduction of 50 cents a ton would compel a large number of mines on the old range to suspend operation. The Great Northern railroad has officially announced that its rate on ore from mines to upper lake docks will be 60 cents, the same as that of the Steel Corporation roads. Shipments of ore from Lake Erie docks amounted to only 284,569 tons for January. The decrease compared with December, when 773,503 tons were moved, was due to the extremely cold weather

which made the handling of ore very difficult.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—The United Steel Co., Canton, has purchased 2,500 tons of basic for March delivery, 2,000 tons coming from a furnace having a freight rate of 50 cents, and 500 tons from another furnace. It is understood that the price was about $12.40, valley. Stocks of basic on valley furnace yards by the end of the month will have been so depleted that they will be almost negligible. Demands of Pittsburgh consumers for spot and nearby iron are so heavy that requests for shipment are very urgent. The constant narrowing of sources of supply for valley merchant basic, it is believed, is spreading a spirit of independence among makers. On the sale of 1,000 tons of foundry iron at Springfield, O., a Cleveland furnace which took the business quoted about $12.75, furnace. The market is quiet and no inquiries of importance are pending. The decision of Corrigan, McKinney & Co. to build a third blast furnace insures their continuance as a factor in the foundry pig iron market. We quote, delivered in Cleveland throughout the first half, as follows:

No. 1 foundry	$13.75
No. 2 foundry	13.25
No. 2 southern	14.35
Gray forge	12.50
Bessemer	15.15
Lake Superior charcoal	16.50
Jackson co. 8 per cent silvery	17.05

Coke.—There is very little activity in the market, but prices continue firm. There is still a marked scarcity of stock coke. We quote:

Connellsville furnace coke, $1.90 to $2.00 for prompt delivery, and $1.85 to $2.00 on contract; Connellsville foundry coke, $2.25 to $2.40 for prompt, and $2.25 to $2.40 on contract.

Finished Material. — Wire business seems to be enjoying greater activity at present than any other branch. Specifications against wire contracts are very satisfactory and some orders are being taken at the new prices. The sheet market shows signs of weakness and some sellers are apparently eager to dispose of their stocks on hand. There is some cutting on plates, shapes and bars, but not to the extent indicated by some reports. T. H. Brooks & Co. will furnish the 250 tons of steel required for the erection of the building of the Neal Warehouse Co., at Euclid and Seventy-first street, for which Andrew Dall & Son have the general contract.

Old Material.—Weather conditions have so hampered carloading in this city and its vicinity that shipments have been practically shut off for some days past. Little stock is moving either in or out of yards. Consumers of heavy melting steel are doing little buying, declaring themselves covered. Rolling mills also are reluctant to buy. The following prices, gross tons, f. o. b. Cleveland, are regarded as largely nominal:

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	11.75 to 12.00
Old steel rails (over 6 ft.)	12.00 to 12.50
Relaying rails	19.50 to 20.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.00 to 11.50
Steel axles	17.00 to 17.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.50 to 11.00
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50
Bundled sheet scrap	8.50 to 9.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.50 to 10.00
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	7.00 to 7.25
Pipes and flues	8.50 to 9.00
Wrought drillings	7.00 to 7.25
Stove plate	9.00 to 9.50
Cast borings	6.50 to 7.00
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	15.50 to 16.00

Cincinnati

Pig Iron Market Tending to Firmness —New Building Projects.

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., Feb. 13.

Pig Iron.—While the market here still remains quiet, and while no large sales or inquiries are being reported, it seems to be gaining strength, with a tendency to rise above a $10, Birmingham, basis. By far the majority of dealers here, though not all, say they do not know of any No. 2 foundry iron in Birmingham direct that can be had for $10, but most of them admit that some can still be had throughout the south on a $10, Birmingham, basis. Shipments are reported in most cases to be going forward at a satisfactory rate, but the railroads are not able to make deliveries in all cases so that the iron can be had on scheduled time; in fact, some melters are handicapped as a result of not being able to get supplies as fast as they are needed. Stocks in yards in Birmingham decreased from about 230,000 tons to 213,000 tons during the month of January. In some cases it is reported that the iron from certain furnaces is not being stacked, but is being shipped as fast as it is made, and as previously stated, most furnaces have their output fairly well contracted for during the first quarter. The northern situation is unchanged, with northern foundry No. 2 still firm at $13, Ironton, and there are no indications of this price being shaded at present. New inquiries here include 500 tons of southern iron for a local melter for last half delivery, on which dealers are slow to quote because of the time of shipment; 1,200 tons of Scotch iron for a Canadian company for first half delivery; 100 tons of northern No. 3 for Illinois delivery and 200 tons of northern No. 2 for Indiana delivery, both for third quarter shipment. Sales made during the week include 500 tons of northern iron, which was sold to a southern Ohio melter; 225 tons of analysis iron which went to a central Ohio buyer for first quarter delivery; 500 tons and 300 tons in separate shipments of northern No. 2 foundry on a $13, Ironton, basis, which was bought by a southern Ohio melter for delivery to July 1; 500 tons of northern No. 4 foundry for February and March delivery, and 400 tons of southern No. 2 foundry for shipment to July 1, which went to a central Ohio user; 200 tons of charcoal iron for shipment in February and June and 500 tons of charcoal iron for delivery in the next 60 days. Mannie furnace, which was banked recently for repairs and which it was reported would be blown in Feb. 20, will not go in until March 1. Freight rates from Birmingham, $3.25, and from Ironton, $1.20. We quote below Cincinnati prices, as follows:

Southern foundry No. 2	$13.25 to 13.75
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	13.75 to 14.25
Southern No. 2 soft	13.25 to 13.75
Standard southern car wheel	25.25 to 25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.45 to 13.70
Jackson co. 8 per cent silicon	16.45 to 16.95

Coke.—The coke market here is practically unchanged from the report of last week, and prices are very firm. As has been the case for some time, sales are being made mostly in small lots for prompt shipment. Local dealers report a shortage of box cars and a shortage of coke, and state that there is a shortage of labor in the coke fields. There are no large sales being made, principally because the coke has all been contracted for, or is being sold as fast as it is being made. The only inquiry reported is for 50 cars of foundry coke for this territory. Connellsville foundry coke, on which an advance in price was quoted last week, is now firm at

$2.25 to $2.40 for both prompt shipment and contract for second half delivery. We quote below from the leading coke producing districts as follows:

	Prompt. shipment.	Contract second half.
Connellsville district.		
Foundry coke	$2.25 to 2.40	$2.25 to 2.40
Furnace coke	1.85 to 1.90	1.85 to 2.00
Wise county district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	$2.00 to 2.10	$2.00 to 2.10
Furnace coke	1.65 to 1.75	1.70 to 1.90
New river:		
Foundry coke	$2.50 to 3.15	$2.60 to 3.25
Furnace coke	2.00 to 2.10	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16¾ per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Several projects are pending in the structural line, and while none of them have actually materialized, it is probable that they will all be realized in due time. Plans for the new Gibson House, which will cost approximately $1,000,000, and which will be located on Walnut street, between Fourth and Fifth streets, on the site of the present hotel of the same name, have not been completed, but the general building plans were recently accepted by the city authorities. They are being finished by Architect Gustav Drach, of this city. H. Harig & Co., Cincinnati, have the contract for the new annex to the Sinton hotel here, which will consist of 42 rooms, and which will cost about $100,000. The plans for this work are in charge of the firm of Elzner & Anderson, architects, also of Cincinnati. A new hotel to cost about $70,000, and which will be located on Seventh avenue, is being considered. It will have about 150 rooms, and the plans are also being prepared by Architect Drach. There is nothing new regarding the proposed new Union Station here. We quote Pittsburgh prices on finished products mostly sold in Cincinnati as follows:

Steel bars, 1.60c base; iron bars, 1.55c to 1.60c base; structurals, 1.70c base; plates, ¼ inch and over, 1.70c base; sheets, blue annealed, No. 10, 1.90c base; rivets, cone head, 2.25 base; cold rolled shafting, 55-57 discount; boiler tubes as follows: 1¾ to 2¼ inch, 61 per cent discount; 2½ inch, 63 per cent discount; 2¾ to 3¼ inch, 66 per cent discount; 3½ to 4½ inch, 68 per cent discount; and 5 to 6-inch, 61 per cent discount; and soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.70c; ⅝ inch square and larger, 1.80c; ½ inch square and larger, 1.90c; ⅞ to ⅜ inch square and larger, 2.10c; ¼ inch square and larger, 2.20c to 2.30c.

Warehouse prices are firm, and business remains unchanged and fair. Buying during the past week has not fallen off any, and most of it is done in moderate lots. There are occasional sales, however, of fairly large lots We quote warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 1.15c; tank plates, 1.15c; black sheets, No. 28 gage, 1.90c; galvanized sheets, No. 28, 2.90c; sheets, blue annealed, No. 10, 1.40c; beams, 1.15c; all Pittsburgh basis.

Old Material.—The scrap iron market here is still unchanged as to activity. Some local dealers look for better business since the break in the recent cold spell, providing, of course, that the weather remains moderate, as the mills here are expected to buy as soon as their coke and other supplies can be delivered more promptly. One large dealer reports a decline of 50 cents in all prices on all materials quoted. There are no large lists pending and no large sales reported made during the past week. Buying and selling is being mostly done in small lots, and stocks on hand in most of the yards have not declined to any noticeable extent. According to a summation of dealers' reports, prices are as follows:

GROSS TONS.

Old iron rails	$12.00 to 13.00
Old steel rerolling	11.00 to 11.50
Old iron axles	18.00 to 18.50
Steel melting scrap	9.50 to 10.50
Car wheels	10.50 to 11.00

NET TONS.

Old No. 1 R. R. wrought	$10.50 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 busheling	8.00 to 9.00
Stove plate	6.50 to 7.00
Machine shop turnings	5.50 to 6.00
Cast borings	4.50 to 5.00
Grate bars	6.00 to 7.00
Sheet iron, bundled	6.50 to 7.50
No. 1 cast scrap	10.00 to 10.50
Heavy turnings	6.00 to 7.00

To Sell Globe Iron.—Eaton, Rhodes & Co., Cincinnati, have been appointed exclusive agents for the sale of Globe ferro-silicon iron in western Pennsylvania and northeastern Ohio.

Philadelphia

Markets Continue Quiet—Fabricated Work Going at Low Prices.

Feb. 12.

Quiet conditions continue to dominate all markets in the eastern district. Pig iron is especially in a listless state, though the monthly statistics of the Eastern Pig Iron Association show no great modification of the order tonnage on furnace books. Two additional furnaces are blowing out in this district. Finished conditions present little change in the volume of business done, but sharp price concessions are being made in some lines. Quotations made on fabricated material in this district have touched low levels. Old material buying in the open market is light.

Pig Iron.—Unusually quiet conditions prevail in the pig iron market in this district, though several good-sized inquiries have appeared in the past few days. This dullness is a repetition of the state of trade for the past two or three weeks, but statistically there is little variation in the situation covering total orders and shipments of the past month, according to the reports submitted at the monthly meeting of the Eastern Pig Iron Association the past week. Curtailment of furnace activities in the east is once more in evidence. The one Brooke stack blowing has gone out and the Emporium furnace will soon suspend operations. The Sheridan furnace, which was planning to resume, is still cold. Steel-making irons have been the most productive of inquiry in the week. A consumer in this territory is reviving an inquiry for 5,000 tons of low phosphorus iron for forward shipment. The receivers of the Central Iron & Steel Co., Harrisburg, are asking prices on 2,000 tons of basic. Standard low phosphorus iron continues quotable at $19 to $19.50, Philadelphia, and basic at about $14.25, eastern Pennsylvania, though this level has been shaded in some recent cases. A wide range of values continues to mark the foundry iron market. Lehigh valley No. 2X iron has sold as low as $13.75, furnace, equivalent to about $14.50, delivered in this district, though such prices are exceptional. Some No. 2X sales have gone as high as $15.35, Philadelphia. The average normal market is about $15, Philadelphia. A New Jersey consumer is inquiring for 900 tons of No. 2X and 900 tons of No. 2 plain for second quarter. Low prices are understood to have been made on some recent sales of pipe iron to Delaware river buyers, and $14, delivered, has been shaded. An eastern Pennsylvania iron mill is still inquiring for 1,000 tons of standard forge for March-April shipment and expects to close around $14, delivered. The leading Virginia maker is actively offering all grades of foundry iron for second quarter at $12.25, furnace, but is asking $12.50, furnace, for 2.50 to 3 per cent silicon iron for this quarter.

We quote, delivered in Philadelphia and vicinity, as follows, switching and handling charges from docks being included for Virginia and southern iron:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.00 to 14.25
Basic	14.25
No. 2X Virginia	15.50 to 15.75
No. 2 southern	14.50 to 15.00
Standard low phosphorus	19.00 to 19.50

Finished Material.—Very keen competition for fabricated tonnage has been manifested in this market the past week and several important contracts have been closed at prices

which are represented as having shaded $40 a ton, delivered. Several other lettings await formal announcement.

The American Bridge Co. has taken 1,200 tons for the building for the J. B. Stetson Co., this city, and is expected to receive both the Manufacturers' Club, this city, 2,300 tons, the general contract for which was placed this week with Irving & Leighton. and also the 2,000 tons for the stock exchange, this city, which went to general contractors the previous week. Bethlehem sections were originally specified for the Stetson building, but standard shapes were finally substituted. The Belmont Iron Works has taken 2,600 tons for the power house of the Lehigh Coal & Navigation Co., at Lansford, Pa., which includes 1,000 tons of Bethlehem sections. Bids go in Feb. 17 on a large foundry for the Washington, D. C., navy yard.

Reports of concessions on steel bars have reached this market, but these seem to apply largely to associated lines such as standard spikes, in which sharp cutting is being done. For immediate specification standard spikes are being quoted very low and for first half contracts, around 1.40c, Pittsburgh.

Leading steel bar makers report they are holding this product firmly at 1.15c, Pittsburgh, or 1.30c, Philadelphia. Plates and shapes are quotable at 1.15c to 1.20c, Pittsburgh, or 1.30c to 1.35c, Philadelphia, but the market is not strong at this level on desirable size and tonnage specifications. There has been a very active movement of nails and wire on specification against contracts in eastern territory, due to the recent price advance.

Eastern plate makers in some cases report a better order tonnage going to the mills and a little heavier operations, but a general survey of the situation reveals practically no improvement. The receivers of the Central Iron & Steel Co. are now taking inventories preparatory to continuing operations under the direction of the court. Some fair locomotive orders are pending, including one lot of 50 and another of 25. The Virginia railroad has recently placed an order for 15 locomotives.

We quote, for delivery in Philadelphia and vicinity, as follows:

Structural shapes, 1.30c to 1.35c; steel plates, 1.30c to 1.35c; steel bars, 1.30c; common bar iron, 1.25c to 1.30c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage, 1.55c to 1.60c; 4 x 4-inch open-hearth rolling billets, $22.40 to $23.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburgh report.

Old Material.—Leading buyers are still slow to negotiate sales through dealers, but there are indications to support the belief that these consumers are more liberally patronizing the railroad lists direct. The Pennsylvania and other eastern roads closed out their accumulations the past week and on the former the heavy melting steel is understood to have gone at from $12.25 to $12.50, delivered. Dealers bidding $12, delivered, on this material received no portion of it and only small lots at offers around $12.25, delivered. Yard steel has sold in recent cases as high as $12.25, delivered, in the east, but the mills usually will not consider first class melting stock at above $12, delivered. Wrought and cast grades are very quiet.

We quote, gross tons, delivered in eastern Pennsylvania and southern New Jersey consuming territory, as follows:

Old iron rails	$15.75 to 16.25
Old steel rails (rerolling)	13.75 to 14.25
No. 1 heavy melting steel	11.75 to 12.25
Old car wheels	12.00 to 12.50
Old iron axles	22.00 to 23.00
Old steel axles	17.00 to 17.50
No. 1 railroad wrought	14.25 to 14.75
Wrought pipe	11.50 to 12.00
Cast borings	8.00 to 8.50
Machine shop turnings	9.00 to 9.50
Heavy cast	12.50 to 13.00
Malleable	11.75 to 12.25
Stove plate	10.00 to 10.25

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

Buffalo

Slight Increase in Pig Iron Activity —Building Prospects.

Feb. 13.

Pig Iron. — There seems to be a little more activity in the way of inquiry, in that large buyers are coming into the market for tonnage up to July 1. The sales for the week are reported at 7,000 to 8,000 tons. The bulk of the orders coming from eastern Canada and New York state, are for low grade foundry, malleable and a little charcoal iron. An order for 500 tons of malleable was closed at $13.75 Buffalo. The improvement in sales this week over last, while not very decided, shows a favorable turn which will no doubt be more noticeable from now on. The furnaces continue to ship to the full extent of their production. The market here on pig iron is substantially as follows, f. o. b. furnaces:

No. 1X foundry	$13.75 to 14.25
No. 2X foundry	13.75 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.25 to 13.50
Gray forge	13.25
Malleable	13.75 to 14.25
Basic	14.00 to 14.50
Charcoal	15.75 to 17.25

Finished Material.—The week shows considerable action in structural material. The tonnage is made up of a lot of small orders, rather than a few heavy ones. These are being figured upon by the local fabricators. Prices remain the same on bars, plates, shapes, sheets, wire nails and wire products. Specifications on contract continue good, although retarded by the severe weather, which has practically tied up outside construction. A heavy demand for chain has advanced the price $4 per ton. A number of inquiries have been received on cold rolled steel. Bids will be opened this week on the St. Francis hospital, Niagara Falls; the Auditorium and Clinic at Cornell University, Ithaca, N. Y.; Technical High school, Buffalo and the Vendig hotel, Philadelphia.

Old Material.—The market situation is about the same as last week. Sales have been held down to a minimum on account of weather conditions; dealers being unable to get at stock on the yards and consumers disinclined to buy in the face of indefinite deliveries. The smaller number of sales has not affected prices, as they are the same as last week, with the exception of car wheels, which are bringing an advance of 25 cents. We quote, gross tons, f. o. b. Buffalo, substantially as follows:

Heavy melting steel	$12.00 to 12.75
No. 1 railroad wrought scrap	14.00 to 14.25
No. 1 R. R. and mch. cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Iron axles	22.00 to 23.50
Car wheels	13.00 to 13.25
Railroad malleable, scrap	12.50 to 12.75
Wrought iron and soft steel turn.	7.25 to 7.50
Cast iron borings	6.75 to 7.00
Low phosphorus steel scrap	15.25 to 15.50
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	13.75 to 14.25
Pipe and tank	10.00 to 10.50
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

Welsh Tin Plate Trade

Swansea harbor trust returns for the week ending Jan. 20, with comparisons, follow:

	Recd. Boxes.	Shipped. Boxes.	Stocks. Boxes.
Week Jan. 20	125,479	92,815	191,969
Prev. week	88,599	94,582	159,305
Same wk. last year	85,373	99,570	188,999

The stack of the Perry Iron Co., at Erie, Pa., was blown out Feb. 7 for relining. The P. J. Brown Construction Co., Cleveland, has the contract for the work.

St. Louis

Limited Inquiry for Pig Iron and Few Sales.

Feb. 12.

Pig Iron.—Inquiries are in the market in the St. Louis territory as follows: Northern foundry 300 tons, for shipment over the first half of the year; southern foundry No. 3, 600 tons, for shipment in February, March and April; southern foundry, 375 tons; southern foundry, 300 tons; southern foundry, 100 and several scattering inquiries for car lots. One local sales agent reports a sale last Saturday of 1,000 tons of southern iron and another of 300 tons of northern iron. With these exceptions, the market is extremely dull, with very little prospect of improvement. Northern prices remain at $13 to $13.50, Ironton, and southern prices at $10 to $10.50, Birmingham.

Tabulated, we quote southern iron as follows, delivered, to which the Birmingham freight of $3.75 has been added:

Southern No. 1	$14.50 to 14.75
Southern No. 2	14.00 to 14.25
Southern No. 3	13.50 to 13.75
Southern No. 4	13.00 to 13.50

Coke.—Sales for the last week have been limited to single car lots, but there is one concern asking for prices on 45 cars of Connellsville foundry coke. The inquiry may result in an order this week. Prices remain as follows:

We quote 72-hour Connellsville foundry grades, $2.15 to $2.40 for first half of 1912; 72-hour foundry, $2.15 to $2.25 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.75 to $1.80; best 72-hour Virginia foundry, $2.15 to $2.25; 48-hour Virginia furnace, $1.75 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—Several buildings, any one of which would require a thousand or more tons of structural steel, are on paper, but none has materialized as yet, and business in structural iron is dull.

Old Material.—Dealing in scrap iron continued about at a standstill, with prices unchanged as follows:

GROSS TONS.

Old car wheels	$13.00 to 13.50
Old iron rails	14.00 to 14.50
Re-rolling rails (5 feet and over)	12.00 to 12.50
Old steel rails (3 feet and under)	10.75 to 11.25
Light section relayers (45 lb. and under) subject to inspec..	20.00 to 21.00
Re-laying rails, subject to inspec.	23.50 to 24.00
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

NET TONS.

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs.	9.00 to 9.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.75 to 9.00
Pipe and flues	7.50 to 8.00
Tank iron and cut boilers	7.00 to 7.25
No. 1 cut busheling	8.50 to 8.75
No. 2 cut busheling	6.00 to 6.25
Cast and mixed borings	5.25 to 5.50
Machine shop turnings	6.25 to 6.50
Railroad malleable	9.50 to 10.00
Agricultural, malleable	8.50 to 9.00
Stove plates	8.75 to 9.25
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	9.25 to 9.50

Birmingham

Ten Dollar Quotation Narrowing to a Few Brands.

Birmingham, Ala., Feb. 12.

Pig Iron.—The aggregate of sales made in the past week is small comparatively, but a higher average price was received than during the week previous, and the market is considered on a firmer basis. The $10, Birmingham, now applies to spot deliveries, and for certain brands, and the number of brands so quoted is narrowing. A leading producing interest practically withdrew from the market during the past week, and a small concern which has been quoting $10, Birmingham, for No. 2 foundry, for spot delivery, advanced to a basis of $10.25 per ton at Birmingham. As was generally expected, stock returns as of Feb. 1 showed a very substantial decrease in the aggregate accumulation to have been made in January. The aggregate of free foundry iron now on furnace yards is less than 140,000 tons, or less than 10,000 tons for each of the furnaces in blast on such grades, while warrant holdings have been reduced to an aggregate of 50,500 tons. The basic accumulation is approximately 25,000 tons, which is practically in the hands of one concern. Notwithstanding the small stock accumulation comparatively, no plans are under way for a larger furnace production, and the operators are still indisposed to consider tonnage for shipment after July 1. For third quarter delivery, an aggregate of 1,000 tons of analysis iron was sold in the past week, but this transaction was of rather an unusual nature, and involved a special grade of iron. It is not believed that any regular fracture iron has been sold for shipment during the last half, but it is likely that the trade has provided for its first half requirements to a greater extent than is usually understood. Such a condition is indicated by the tonnage now on order books for shipment in the first half, and by the tonnage contracted for that is being held up. No recent sale of basic iron is reported, but prices for that grade are considered stronger owing to the location of the available stock, and to the advance in prices for foundry grades. The conditions existing relative to charcoal iron are practically unchanged, with a smaller output expected in the near future. We quote the several grades represented, for shipment in the first half of this year, as follows, per gross ton, f. o. b. cars at Birmingham district furnaces, viz.:

No. 1 foundry	$10.50 to 11.00
No. 2 foundry	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Forge	9.00 to 9.50
Mottled	9.00 to 9.50
Standard basic	10.00 to 10.50
Off basic	9.75 to 10.25
Standard charcoal	22.50 to 23.00

These prices are per gross ton f. o. b. cars at Birmingham district furnaces.

Cast Iron Pipe.—Very material additions have been made to order-book requirements of local producers within the past week, and shipments against contracts entered previously are being made at a much more satisfactory rate. Among the contracts recently placed, the requirements at Atlanta, Ga., Albany, Ga., and Los Angeles, Calif., are the most important. An addition of some 2,000 tons has just been made to contract placed some time since for Spokane, Wash., which is being furnished by the United States Cast Iron Pipe & Foundry Co. A contractor's letting for water pipe requirement at Lexington, Tenn., is to be held within a few weeks, but the tonnage to be placed is not known. The volume of small orders coming up from time to time is very attractive, and particular attention is given the number of bond issues of recent date for municipal improvement. There has been no change in quotations and the market is considered firm at the prices named below, with the usual shading for large municipal requirements. We quote as follows, per net ton, f. o. b. cars here, viz.: 4-inch to 6-inch, $23; 8-inch to 12-inch, $22; over 12 inches, average $21, with $1 per ton extra for gas pipe. Special fittings are quotable at from $45 to $55 per net ton at foundry owing to nature and size of tonnage.

Old Material.—No changes have been made in asking prices since last report, and the recent demand was a of a very desultory nature. Dealers exchanged some tonnage in the past week, and made some additions of machinery cast and country grades to stocks. The movement to the north

and eastern markets has been very light for some months, and local mills have bought only as required. We continue to quote as follows, per gross ton, f. o. b. cars here:

Old iron axles (light)	$12.50
Old steel axles (light)	12.00
Old iron rails	11.50
No. 1 R. R. wrought	10.00
No. 2 R. R. wrought	9.50
No. 1 country	6.50
No. 2 country	6.00
No. 1 machinery	9.00
No. 1 steel	8.50
Tram car wheels	8.50
Standard car wheels	10.00
Light cast and stove plate	6.50

British Market

Pig Iron Has Become Dull, But Finished Lines are Good.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Feb. 3.

Pig Iron.—The week has been dull in pig iron. There is hardly any buying, mainly because consumers took care weeks ago to cover their requirements for the first half-year, and transactions are, therefore, only with small and quick buyers. In spite of the quiet tone, smelters consider themselves justified in keeping up their quotations, in view of the heavy consumption, which must soon bring more business into the market. Merchants have taken the opportunity to offer some iron a little below market prices, but the quantity is of no importance. With order books well filled, makers regard these transactions with indifference. It is remarkable that new pig iron has not gone below 50s per ton ($12.24), while second hand has sold as low as 49s ($12). The lower qualities of Cleveland pig iron have become very scarce. Makers have been somewhat disappointed with the January shipments, which totalled only 86,286 tons, as compared with 150,419 tons in December, and 84,179 tons in January last year. At Dec. 30, the stock was 528,416 tons, a decrease of 8,218 tons, as compared with a decrease of 20,385 tons in December. The amount is very little short of the average. It compares badly with 1907, when 140,143 tons were shipped, but that was largely due to heavy American buying. It is remarkable that, for the first January in several years, not a single ton of pig iron has been sent to the United States or Canada.

Finished Iron and Steel.—The finished markets show nothing of the fluctuations of pig iron. In the Sheffield district nothing but the uncertainty as to the situation in the coal trade prevents confident anticipations of an excellent year. In the railway material branches, all the houses are full of work, several home railways having lately placed orders. A record year is expected in Sheffield steel trades, especially as nearly all the works have increased their capacity. In all the heavy steel branches, the pressure of work is greater than in December, owing to increased demands for steel forgings and castings from ship, locomotive and wagon builders, but business is being much obstructed by the almost complete breakdown of the railway arrangements for handling traffic. The lighter steel trades are finding full work for the rolling mills although January is usually a quiet month. High-speed steel is somewhat below the average, and it is believed this is due to keen competition from America, resulting in lower exports here. There is a good deal of talk in Sheffield about great improvements American makers have effected in high-speed steel, and it is believed that this will considerably affect Sheffield business. At Barrow, the steel trade is very vigorous, makers having heavier orders than for a long time in the Bessemer departments. Demands for rails, tin bars and billets are unusually heavy. In Scotland, several good ship building contracts have brought the bookings for the month to over 100,000 tons. Nearly all the yards are booked for over a year, and some of them for two years. Several steelmakers are out of the market.

METAL MARKETS

St. Louis

Feb. 12.

Lead and Zinc.—Lead ore suffered the greatest slump in years last week, 80 per cent Galena dropping from $64 to $48 and $44 a ton in the Missouri-Kansas-Oklahoma district and producers found difficulty in selling at any price.

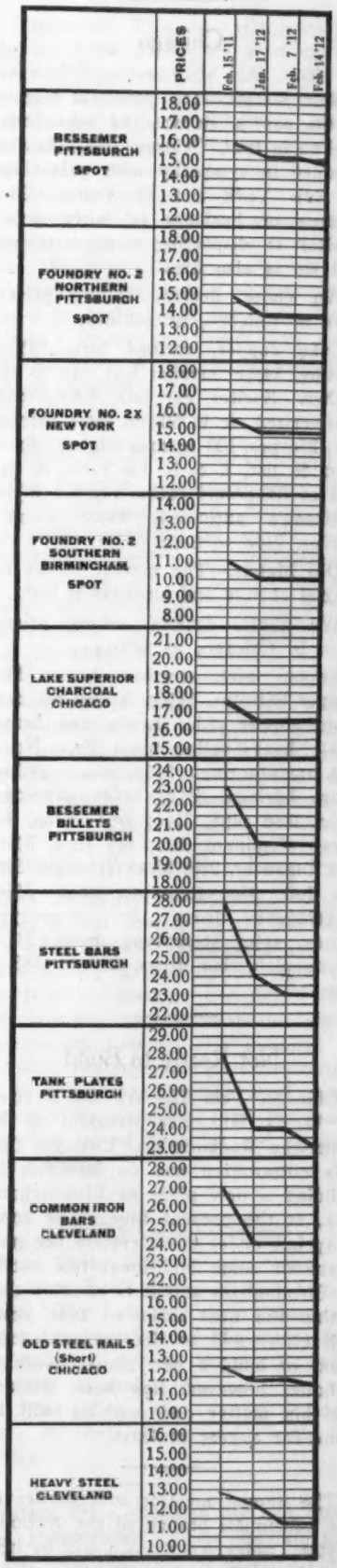
Because of the high prices that had continued for some time producers and operators have endeavored to increase their output, with the result that a very heavy surplus is now on the market.

Pig lead, which had been steady at $4.37½ to $4.40, East St. Louis, for several months, dropped to $3.92½ to $3.95.

The demand for zinc ore was little changed, choice lots bringing $46 a ton, and 60 per cent grades commanding $43 to $46 a ton.

The demand for calamine was

PRICE CHART



strong. Choice lots brought $30 a ton, while 40 per cent grades sold for $25 to $27 a ton.

Chicago

Feb. 12.

New Metals.—The principal feature of the past week was the sensational decline in lead, Chicago prices having tumbled in sympathy with quotations in New York and St. Louis. The volume of business is fairly good. Spelter is displaying some strength and tin is also firm.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 14½c; casting, 14¼c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.40c; lead, desilverized, 4c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin 44½c. Cookson's antimony, 8¾c; other grades, 7½c to 8¼c.

Old Metals.—The market shows no special change and business is light.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13c; copper bottoms, 11½c; heavy cut crucible copper, 13c; heavy red brass, 11¼c; heavy yellow brass, 9½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8¼c; brass clippings, 8½c; lead pipe, 3½c; zinc scrap, 4c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 39c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $80 to $85 a ton.

Not Ready to Build

Chicago, Feb. 12.—We are advised by W. H. Hill, vice president of the American Radiator Co., Chicago, that this corporation has no intention of building a new plant at Birmingham, Ala., at the present time. The company has under consideration the purchase of some additional real estate in Birmingham and it is possible that within the next three or four years will either add to the present equipment or build a new plant. Nothing definite, however, has been decided on this matter and nothing will be done for a year at least.

The annual meeting and dinner of the Cincinnati branch of the National Metal Trades Association will be held on March 7 at the Business Men's Club, Cincinnati.

HILL'S IDEAS

Concerning Regulation of Corporations and Other Subjects.

Stockholders of the Great Northern railroad profited most through the leasing of the so called Hill ore lands by the United States Steel Corporation, according to the testimony of James J. Hill, chairman of the board of that railroad, given before the Stanley investigating committee at Washington this week. The former president of the Great Northern testified that he bought ore properties for more than $4,000,000, turned them over for that amount to the Lake Superior Co., Ltd., as trustee for the railroad stockholders, and presented the stockholders with pro rata certificates for the increased value of the property.

Mr. Hill was questioned at length relative to the leasing of the lands by the Steel Corporation.

"I wouldn't take $1 a ton for the ore." said Mr. Hill.

"Why did the Steel Corporation cut the freight rate from the Lake Superior region to the upper lake docks?"

"Why I think the Steel Corporation got scared to death," Mr. Hill answered, "That's all there is to it."

Mr. Hill in explaining why he had turned over the properties to the trustee company stated that he was reimbursed for what he had paid and that the increased value was a gift to the Great Northern stockholders.

"I got back all I had paid," he said, "and the stockholders of the railroad got the benefit of the additional value. I was in a measure dealing with myself. I bought the property to get control of the transportation of the Lake Superior region. I purchased it as an individual, because as a railroad company, I do not think the Great Northern would have the legal right to own and operate mines."

Mr. Hill stated that the first property he acquired on the Mesabi range was property that came with the Duluth and Winnipeg, a bankrupt railroad, running into Duluth and the Superior region. There was 12,000 acres in the property.

On Tuesday, Mr. Hill informed the members of the committee that he would "be a first-class angel with red and white feathers in my wings long before I ever consider going into the steel business. I'll be 74 years old my next birthday and I don't mind telling you that I've done about all the hard work I intend to do in life."

Mr. Hill denied that he had at one time contemplated going into the steel business, Chairman Stanley having asked the question with an intimation that such a decision on his part led the Steel Corporation to lease the Hill ore lands.

In reply to the request for his opinion on the declarations of E. H. Gary, chairman of the board of the Steel Corporation, to the effect that the day of competition was passed in this country and that the government must regulate maximum and minimum prices of commodities, Mr. Hill declared that human nature would have to be tamed and selfish motives eliminated before competition was eliminated.

After stating that if the federal government assumed control of business, it would be a short step until there was no federal government, Mr. Hill declared. "I would limit the power of corporations. I would see that every corporation that started business put all the money in, and I would not be jealous on account of the size of the corporation. I would not permit any watering of stock. I would see that 100 cents on every dollar was put up and that money was on hand to take care of it."

Mr. Hill told the committee that the report of the bureau of corporations compiled by Commissioner Herbert Knox Smith, on ore values, was not worth reading. He stated that he had gone over part of it and concluded it was of no value.

Will Erect Machine Tool Plant

The American Tool Works Co., Sixth and Eggleston avenue, Cincinnati, manufacturer of lathes, planers, shapers and radial drills, will soon build a new plant to cost approximately $300,000, in Bond Hill, a suburb, on a site of 12 acres owned by this company. The present plant is inadequate to care for the company's increasing business. At the annual meeting of stockholders which was held recently, plans were submitted and discussed, but no definite action was taken. The new building will be 400 x 400 feet, of steel and concrete with saw-tooth roof construction, The officers are: President, Franklin Alter; vice president and general manager, J. B. Doan; secretary, Robert S. Alter, and treasurer, Henry Luers. Luther Kirkpatrick and Louis Voorheis are additional directors.

The Aviation Club, of Los Angeles, Cal., contemplates the erection of a plant for the manufacture of aeroplanes. A site has been acquired.

WORLD WIDE MOVEMENT

To Conserve Life will be Started at Milan Congress.

The new American idea of the safety engineer, an accident prevention specialist, will be brought to the notice of world industrialists at an international safety congress to be held in Milan, Italy, for five days, beginning May 27, 1912.

This congress, the first of its kind of international scope ever held, will be for the purpose of setting in motion a world-wide movement for the conservation of human life in industry.

The American Museum of Safety, 29 West Thirty-ninth street, New York, is making preparations so that the United States will be well represented. An American national committee has been selected by the American museum to co-operate with the international body and to promote the American ideas and views at the congress. Dr. W. H. Tolman, director of the American Museum of Safety, and other members of the committee, will attend the congress.

The following are some of the papers which will be read:

"The Safety Engineer on a Large Transportation System," by Dr. W. H. Tolman, chairman, American national committee; "How the New York Edison Safeguards the Lives and Limbs of Its Employes," by Arthur Williams; "The Work of the Safety Committee of the United States Steel Corporation;" "Safeguarding the Traveling Public and Protecting the Employes of The Electric Street Railway Association;" "Proper Illumination and Accident Prevention," by J. V. Lansingh, president of the Illuminating Engineering Society.

Moved to New Location

Brown Specialty Machinery Co., Chicago, has been located at 2440 West Twenty-second street, Brown Bros. building, since Feb. 1. Its factory occupies double the space of its old location. Its offices will be located, together with those of the Brown Bros. Mfg. Co., in the new office building.

Sinking Cement Shaft.—The Adams shaft, located about 2½ miles south of Deerwood, Minn., is now down a depth of 50 feet. Good progress is being made in sinking the cement shaft. A seam of gravel was struck a few days ago and the huge tube of cement shot down 7 feet in one plunge and only went about ¼ inch out of plumb. This drop is said to be a record for the Cuyuna range.

Plant of Illinois Car and Equipment Co. Taken Over

Chicago, Feb. 9.—The Western Steel Car & Foundry Co. has purchased the plant of the Illinois Car & Equipment Co., in South Chicago, for a consideration stated to be $1,100,000. This plant, which comprises over 100 acres and thoroughly modern equipment for the manufacture of railroad cars, has been occupied by the purchasing company under lease for some time.

The land comprising the plant was given to the Calumet & Chicago Canal & Dock Co., in 1884, to be used as a site for the works of the United States Rolling Stock Co. The property subsequently went through several reorganizations, finally becoming the Illinois Car & Equipment Co., which has owned the plant since 1898 and operated it until 1902, when it was leased to the Western Steel Car & Foundry Co. The latter is said to have expended about $2,000,000 in improvements. The plant employs between 4,000 and 5,000 men, and its capacity is 60 cars a day.

Protecting Employes of Mines

The Oliver Iron Mining Co. has adopted measures to further safeguard its employes. Accidents have been caused by miners being caught by ore cars going to and from the mines. At the Leonard mine, the company has installed a system of bells and lights, the latter for night service, while the bells operate both day and night. They serve to give warning of the car's approach and allow the miner time to seek safety. The company has also established a rescue station at Iron Mountain and is said to be contemplating the installation of one at Norway. The equipment at Iron Mountain consists of three oxygen helmets and a pulmotor and the workmen are being instructed in the use of the apparatus.

Radiator Plant to be Rebuilt

George A. Buskirk, of the Union Trust Co., Indianapolis, receiver for the Shirley Radiator & Foundry Co., Shirley, Ind., announces that the radiator manufacturing plant and foundry owned by this concern will be rebuilt as soon as the insurance is adjusted. The plant was recently destroyed by fire.

BILLETS FIRMER

And Quotations are Higher—Heavy Demand for Coke.

Pittsburgh, Feb. 14. (By wire.)—Rolling billet prices are showing increasing firmness and $20, makers' mills, Pittsburgh, is only a nominal price. As high as $20.50 is being paid this week. Steel sheet bars show equal strength on new tonnage and are quoted freely at $21.50.

Foundry coke demand during the present week is heavier than at any time this year. Many consumers are increasing their orders against contracts to double what they have been taking. Prices are firmer and spot foundry coke is now more generally selling at $2.40, ovens.

Pratt & Letchworth to Build

The Pratt & Letchworth Co., Buffalo, is preparing plans for a new malleable foundry, 225 x 550 feet. The building will not be an enlargement of but will be erected to replace the present old wooden buildings which have been added from time to time. It will be put up in sections so as not to interfere with operations. Arrangments are being made eventually to equip the foundry with overhead cranes or I-beam trolleys for handling material, waste heat boilers and hot air heating system.

Industrial Works' New Foundry

The Industrial Works, Bay City, Mich., is just completing the installation of a two-ton Tropenas converter plant having a capacity of eight to ten tons of castings per day. The company has made an extensive addition to its foundry and installed a complete equipment of saws and other accessories. It will make steel castings for its own use, however, and does not intend to enter the market with castings.

Trolley Cars Ordered

New York, Feb. 14. (By wire.)—The New York News Bureau today says: "The Lehigh Valley Transportation Co. has awarded a contract for 20 pay-enter cars to the J. G. Brill Co., and 10 trolley Pullman cars to the Jewett Car Co., Newark, O., delivery on both orders to be made in 70 days."

During 1911, Michigan licensed 2,699 new corporations. Their capital, together with additions by existing corporations, totalled $431,257,505.

THIRD STACK

Will be Built by Corrigan, McKinney & Co., at Cleveland.

Corrigan, McKinney & Co., Cleveland, will add a third stack to their plant on the west side of the Cuyahoga river. The plant is to operate one stack on merchant foundry iron as has been done since the first stack was blown in, May 28, 1910. The second stack, which has not been blown in, and the third stack, will be used to make basic pig iron for the open-hearth furnaces to be erected, as announced in THE IRON TRADE REVIEW of Nov. 16, 1911. Since that announcement was made, about 30 additional acres of land have been purchased and the company now has 72 acres on the east side of the river, directly opposite the two blast furnaces. The new stack will be almost exactly like the other two and will have a capacity of about 75,000 tons per year. A large force of draftsmen is now engaged in preparing plans for the steel plant, which will consist of eight 60-ton open-hearth furnaces. As to the finishing capacity, nothing has been decided except that billets, slabs and sheet bars will be rolled. Other mills will be erected later to roll finished products. It is expected that work on the construction of the steel plant will begin next spring and on the third blast furnace a little later. A bascule bridge will be erected to carry the hot metal across the Cuyahoga river to the steel plant.

A project is on foot to have the state abandon a mile and a quarter of the old canal bed in order to assist in the development of the upper Cuyahoga river. At a meeting of city officials, Price McKinney, of Corrigan, McKinney & Co., and a member of the state board of public works, preliminary action toward the abandonment of this section of the canal was taken. Mr. McKinney stated that his company expected to expend $3,000,000 at its river plant and that the abandonment of the canal would assist in the development of the upper river valley.

Activities of the Huron Mining Co.

The Huron Mining Co. is continuing the development of its Groveland mine, four miles east of Randville, Mich., on the Menominee range. The old shaft has been sunk to the fourth level and a cross-cut will be driven to the new shaft. This company is also continuing its exploration work at the McDonald property, near Crystal Falls, Mich.; the shaft has been sunk to the fourth level and a cross-cut will be driven to the ore. On the company's Section 26 exploration, near Iron River, Mich., a concrete dam is being cut in on the first level of the mine to catch surface water and as soon as this is completed sinking the shaft will continue. The river nearby makes the water problem a serious one.

New Machine Tool Company in Cincinnati

F. W. Boye Jr., and W. T. Emmes, have purchased the interest of W. A. Schumacher in the firms of Schumacher & Boye and Schumacher, Boye & Emmes, Cincinnati, and have incorporated a new company under the name of The Boye & Emmes Machine Tool Co., to take over these two concerns.

Mr. Emmes has been connected with the firm of Schumacher & Boye as general superintendent for a number of years and has a wide reputation in the mechanical line.

The firm of Schumacher & Boye has been in existence for about 14 years.

Closed for the Season

Avices from Nashwauk, Minn., on the Mesabi range, state that operations have been closed down for the season at the Hawkins mine of the International Harvester Co., largely on account of severe weather conditions. Work on the construction of the new washing plant is being continued and it is expected that the plant will be in operation at the commencement of next season's work. Practically the only properties in the vicinity of Nashwauk where stripping operations are being carried on this winter are those operated by the Oliver Iron Mining Co., under the Hill lease.

Sheet Makers Discuss the Tariff

A conference was held on Monday, in Pittsburgh, by members of the Association of Sheet and Tin Plate Manufacturers, to consider the best means for entering a protest against the proposed tariff changes now pending in congress and which are considered severely drastic to this branch of the steel industry. Only a few members were present and the discussion was informal. It was announced that further discussion would be held and much remained to be done before a definite policy would be outlined for the members to follow.

PLANS COMPLETED

For Splice Plate at Works of Pennsylvania Steel Co.

Steelton, Pa., Feb. 13.—As another step in the improvements that are being made at the plant of the Pennsylvania Steel Co. here, plans have been completed for a splice plate mill, which will be erected below the merchant mill, in the near future.

Work has been in progress for some months on the erection of a new iron foundry near the merchant mill department, and it was reported that the company intended to build a universal and I-bar mill where the iron foundry is now located. But officials of the company deny this, declaring that the present site of the iron foundry would be an objectionable location for any other mill, just as it is for the foundry.

Decry Tariff Reductions

Eastern pig iron producers gave liberal attention to the proposed reductions of the tariff on pig iron at the monthly meeting of the Eastern Pig Iron Association, held at Philadelphia, Feb. 7. The inequalities and injustice of the house measure in its application to the iron manufacturers of eastern Pennsylvania and New Jersey were roundly discussed and it was urged that all members of the association take all means at their disposal to impress upon their senators and representatives the grave dangers to eastern interests involved in the house bill. The members of the association will accordingly follow this line of campaign.

Wellman Bronze Co.—At a meeting of the directors of the Comstock-Wellman Bronze Co., Cleveland, it was voted to change the corporate name to the Wellman Bronze Co. The following officers were elected: President, S. T. Wellman; vice president and treasurer, F. S. Wellman; secretary, H. G. Wellman. The company will continue to specialize in automobile parts, high speed bearings and special bronze. S. T. Wellman is well known as former president of the Wellman-Seaver-Morgan Co.

Plans have been made by the Rockhouse Coal Mining Co., of Pineville, Ky., for the erection of 100 coke ovens.

The Seneca Wire & Mfg. Co., Fostoria, O., has decreased its capital stock from $50,000 to $10,000.

TWO MORE RECEIVERSHIPS

Follow Failure of Central Iron & Steel Co.

Following the appointment of receivers for the Central Iron & Steel Co., Harrisburg, Pa., which was announced last week, similar action has been taken in the case of the West End Furnace Co., West End, Va., and the Lucknow Iron & Steel Co., Harrisburg, Pa., of which companies James B. Bailey, treasurer and general manager of the Central Iron & Steel Co., occupied the position of president. H. H. Creider, general manager of the West End Furnace Co., operating the West End furnace at West End, Va., was made receiver of that property, and E. B. Leaf and John J. Caine, of Philadelphia, were placed by the courts in charge of the interests of the Lucknow Iron & Steel Co., which consist of a rolling mill at Manatawney Station, Pa., and the Lucknow Forge, at Lucknow, Pa., near Harrisburg, both held under lease. The company also controls the Elmira steel works, Elmira, N. Y., which has not been operated in recent years. Bondholders of the Central Iron & Steel Co. have organized a committee consisting of C. J. Rhoads, vice president of the Girard Trust Co. of Philadelphia, as chairman; Robert C. Drayton, vice president of the Penn Mutual Life Insurance Co., Philadelphia; Charlton Yarnall, W. Barklie Henry and Vance McCormick, of Harrisburg. The bondholders' committee has issued the following statement:

"A default having been made in the payments to the sinking fund by the Central Iron & Steel Co., under the terms of the mortgage to secure the issue of its bonds, due Aug. 1, 1925, the interest on which has been paid to Feb. 1, 1912, the undersigned, owning and representing large amounts of bonds, have formed a committee for the protection of the holders thereof.

"The committee invites the holders to deposit them with the Girard Trust, which has been appointed depository, or with with Dauphin Deposit Trust Co., Harrisburg, the depository's agent, for which certificates of deposit will be issued under a bondholders' protective agreement."

Election of Officers.—Stockholders of the Savage Mountain Fire Brick Co., Frostburg, Md., at the recent annual meeting elected the following officers: President, Charles C. Gorsuch; vice president and treasurer, John A. Caldwell. The company enjoyed a prosperous year. The company has a selling office at 1420 Chestnut street, Philadelphia, in charge of E. E. Mellick, an office at Cleveland, in charge of J. J. Shepard, and one in Pittsburgh.

Newport Rolling Mill Co. to Extend Plant

The Newport Rolling Mill Co., Newport, Ky., has let contracts to the McClintic-Marshall Construction Co., Pittsburgh, for the construction of a new boiler house and an extension 200 x 250 feet, to its main mill. The new boiler house will be used to provide power for the additional mill equipment. The construction work is to be completed in about 60 days. The Newport concern manufactures genuine open-hearth iron, black and galvanized sheets and painted and galvanized roofing and siding.

Awards Furnace Contracts

Contracts for the construction of its proposed new blast furnace at Reusens, near Lynchburg, Va., have been awarded by the Oriskany Ore & Iron Corporation, with general offices at Buena Vista, Va. The company will also build a nodulizing plant. The construction will be in charge of W. W. Taylor, general manager of the company. The capital stock of the corporation has been increased to $500,000, and the company has acquired all of the stock, $250,000, of the Barr Ore & Iron Corporation, which operates properties at Pittsville, Va.

Takes Large Contract

The Link-Belt Co., Chicago and Philadelphia, has been awarded a contract for designing and building a coal tipple for the McGregor Coal Co., on Rums creek, Logan county, W. Va. The tipple will be the largest in that section of the country and will be built of structural steel and corrugated iron. It will be equipped with car feeders, trip makers, picking bands, "Link-Belt" shaking screens, slack conveyors, etc.

Authority to Sell

The stockholders of the New Castle Forge & Bolt Co., New Castle, Pa., have voted authority to the directors to sell the plant at the best price obtainable and an effort will be made to dispose of the property at private sale. The directors are: C. J. Kirk, E. W. Beadle, T. F. Morehead, R. C. Patterson, G. H. Patterson, W. H. Cot and J. Norton Martin. The plant is being partially operated at present.

CUYUNA RANGE

Will Probably Have Six or Seven Shipping Mines This Year.

The Cuyuna range, the newest district of the Lake Superior iron region, is expected to have six or seven mines on the shipping list the coming season. Last year there was only one. The Rogers-Brown ore company's Kennedy property, the pioneer of the range and the most advanced in development, is looked to for an output of 200,000 tons, compared with 157,500 tons in 1911. It is employing 300 men. The same corporation's Armour No. 1 is expected to send out 75,000 tons, its Armour No. 2 approximately 40,000 tons and the Meacham mine possibly 20,000 tons. Another shipper will be the Inland Steel Co.'s Thompson property, the prospective outgo from which is placed at 50,000 tons. The ore from all of these mines will be forwarded to the head of Lake Superior via the Soo line. The Barrows property, four miles south of Brainerd, is expected to ship in excess of 100,000 tons. It is being developed by M. A. Hanna & Co., of Cleveland. The Adams property, four miles southwest of Deerwood, and owned by Cuyler Adams, of Duluth, and associates, also is due to make its debut this year. Both the Barrows and Adams will ship via the Northern Pacific. This road has no ore docks and for the coming season at least its tonnage will be cared for at the Superior piers of the Great Northern. The Northern Pacific is itself extensively interested in Cuyuna lands, holding a large acreage under the name of the Northwestern Improvement Co. Exploratory and development work is being prosecuted briskly in various portions of the Cuyuna country and new and promising strikes of ore are of not infrequent occurrence.

Foundrymen Will Meet.—The regular meeting of the New England Foundrymen's Association will be held on Wednesday, Feb. 14, at five o'clock, at the rooms of the Exchange Club, Milk and Battery March streets, Boston. Dinner will be served at six o'clock. The speaker of the evening will be A. W. Moyer, of the Rockwell Furnace Co., New York, who will speak on the subject of "Coke Ovens and Their Design". Mr. Moyer will illustrate his remarks by stereopticon views.

The Fessmer Machine & Tool Co., Detroit, has increased its capital from $10,000 to $20,000.

Personals

W. A. Glasgow has resigned as works manager of the Canadian Steel Foundries, Ltd., at Welland, Ont., to enter other lines of business.

W. A. Rogers, of Rogers, Brown & Co., Buffalo, sailed Feb. 7, for a several weeks' sojourn in the West Indies.

Noah H. Swayne, 2nd, resident manager of Rogers, Brown & Co., Philadelphia, is confined to his home by illness.

Robert E. Brooke has been elected president of the Birdsboro Foundry & Machine Co., Birdsboro, Pa., succeeding the late George Brooke.

Charles W. Stone has become manager of the lighting department of the General Electric Co., Schenectady, N. Y., succeeding the late C. D. Haskins.

Charles C. Leech has resigned as shop foreman of the Pennsylvania railroad, at Buffalo, and taken a position as general manager of the American Roller Bearing Co., Pittsburgh.

W. H. Jobe has resigned as district superintendent of Pickands, Mather & Co., in the Iron River district of Michigan, to become general manager of the new Iron River Steel Co.

George Langen, general manager of the Cincinnati Planer Co., Cincinnati, manufacturer of machine tools, will leave on March 1 for an extended business trip to Europe.

Frank P. Smith, who was formerly associated with the sales force of Manning, Maxwell & Moore, Inc., has rejoined the organization of that company. His efforts will be confined largely to the railroad department.

C. R. McCullough, formerly connected with the Packard Motor Car Co., at Detroit, has joined the sales organization of Manning, Maxwell & Moore, Inc., with headquarters at Detroit.

Thomas Carroll, chief inventor of the National Cash Register Co., Dayton, O., for the past 15 years, has had issued to him the third greatest number of patents issued to any individual in the country.

H. Ives, who has been manager of the Platteville, Wis., office of the Galena Iron Works, has resigned to accept a position as general purchasing agent for the American Zinc & Lead Co., and will be located at St. Louis.

George H. Bryant is now connected with Theodore Geissmann & Co., Commercial National Bank building, Chicago, mill representatives. He was formerly connected with the Scully Steel & Iron Co. and also with J. T. Ryerson & Co.

John W. Gray, until recently connected with the Philadelphia office of the Newport News Ship Building & Dry Dock Co., Newport News, Va., has been appointed general superintendent of machinery of that concern, with office at Newport News.

Coleman B. Ross, formerly with the Linde Air Products Co., has accepted a position with the Independent Pneumatic Tool Co., manufacturer of Thor pneumatic tools, and will be connected with its Pittsburgh office.

L. H. Mesker, who has been connected with the Cleveland branch of Manning, Maxwell & Moore, Inc., has been appointed manager of the St. Louis office of this company, succeeding C. L. Lyle. The St. Louis office of this company is located in the Frisco building.

Herbert W. Gwyn, who for many years was associated with the Richard Heckscher & Sons Co., Swedeland, Pa., and occupied the position of secretary when that company was absorbed by the Alan Wood Iron & Steel Co., has severed his connection with that organization.

H. R. Cobleigh, publicity manager of the International Steam Pump Co., New York, has been elected a member of the New York committee on meetings of the American Society of Mechanical Engineers, in place of Walter Rautenstrauch, who resigned because of other duties.

Edward W. Hake, vice president and general manager of the Monitor Stove & Range Co., Cincinnati, has resigned, and will associate himself with the Estate Stove Co., of Hamilton, O. Mr. Hake was presented a handsome watch by the office force of the Monitor company before he left to take up his new work.

Sanford F. McLeod has resigned as purchasing agent of the Duluth, Missabe & Northern Railway Co., to engage in private business, and will be succeeded by Fred H. White. Mr. White resigned a similar position with the Duluth & Iron Range railroad, and Ralph P. Moore has been appointed to succeed him. The changes are effective March 1.

Dennis H. Long, son of George J. Long, who has been resident manager of the Louisville, Ky., plant of the United States Cast Iron Pipe & Foundry Co., has been named for that position. George J. Long will remain vice president and chairman of the manufacturing committee of the company. Dennis Long, the new manager, is a grandson of the founder of the plant, Dennis Long, who started in the foundry business in Louisvile over 50 years ago. The new manager, who took charge of the position Feb 1, is 28 years old and a graduate of Purdue University.

Obituaries

J. Howard Mitchell, who helped found the William Butcher Steel Works, in 1867, died at Hatboro, Pa., on Feb. 6, aged 79. The William Butcher Steel Works was later reorganized into the Midvale Steel Co., Nicetown, Philadelphia.

Col. Llewellyn W. Johns, formerly general mining superintendent of the DeBardeleben Coal, Iron & Railroad Co., died Feb. 4, at his home at Birmingham, Ala., aged 67 years. He was born in Wales, Nov. 10, 1844, came to this country as a mining engineer and became associated with the Pratt Coal & Coke Co. He later resigned to assume the general mining superintendency of the DeBardeleben Coal, Iron & Railroad Co.

Samuel M. Dodd, aged 79, president of the Wagner Electric Mfg. Co., and founder of the Columbia Incandescent Lamp Co., died at his home in St. Louis, on Feb. 12, from heart disease. Mr. Dodd was a bachelor. During his lifetime he gave liberally to public institutions. He was in the clothing business before the civil war, and later organized the wholesale dry goods house of Dodd, Brown & Co., now dissolved.

S. D. Conover, a prominent citizen of Dayton, O., and founder of the Miami Valley Machine Tool Co., died Feb. 8, aged 69. Prior to a year ago Mr. Conover was president of this company, but retired from active business on account of ill health. He was mainly engaged in the coal business and the oldest coal dealer in the city. He was a director of the Gem City Building & Loan Association, and interested in a number of enterprises. He leaves a widow, a daughter and a son, P. P. H. Conover, the present head of the Miami Valley Machine Tool Co.

Vessel Contract.—The Cleveland & Buffalo Transit Co. yesterday awarded the contract for its new vessel to the Detroit Shipbuilding Co., a subsidiary of the American Shipbuilding Co. The steamer will cost more than $1,500,000 which amount it was thought, before bids were taken, would be ample. How much more than $1,500,000 the contract calls for was not made public. The contract for the steel, about 2,500 tons has not been awarded.

The E. & G. Brooke Iron Co., Birdsboro, Pa., will build an additional Roberts two-pass fire brick stove. Frank C. Roberts & Co., Philadelphia, are the engineers.

The Large Ore Crusher at the Biwabik Mine

Description of an Electrically Driven Iron Ore Breaker Which Has a Capacity of 1,000 Tons an Hour

In THE IRON TRADE REVIEW, Jan. 4, 1912, brief mention was made of the large ore crusher installed at the Biwabik mine, Biwabik, Minn.. Fig. 5, presented herewith, shows the general details of this machine, which is the largest of its kind on the Lake Superior iron ranges. The breaker has a capacity of 1,000 tons per hour, this being limited by the rapidity with which it can be fed. The machine is used to break large lumps of hard ore which occur in the Biwabik mine, thus avoiding the necessity of a large amount of blasting in the pit. The breaker is designed to take any piece that can be handled by a steam shovel; in other words, to crush lumps of ore weighing from 7 to 8 tons. A gyratory breaker was considered preferable to a jaw crusher on account of the continuous crushing action with consequent freedom from shock. This permitted the use of less expensive foundations and decreased the liability of breaking parts of the machine, which, on account of the isolated location of the plant, might cause serious delays.

Sequence of Operation

The breaker is installed at the south end of the pit and the ore is brought from the mine to the machine in 10-ton larries designed by the Biwabik Mining Co. These are handled in trains of seven cars which are hauled up the incline and dumped in the breaker in an average time of 7½ minutes each. After leaving the cars the uncrushed ore first passes over a grizzly provided with 2-inch spaces, which separates the small pieces from those large enough to go through the crusher. The small pieces are carried from the grizzly to one of the discharge bins through a spout set at an angle of 50 degrees. The large pieces pass through the crusher, from which they are delivered into a 72-inch revolving screen provided with 2-inch openings. All of the pieces which have been crushed to less than two inches in diameter pass through the screen into the shipping bin beneath, where they are mixed with those which have been by-passed through the dust spout. The larger pieces fall into a separate bin, as shown in Fig. 5. These bins are placed over tracks and are so arranged that their contents may be discharged directly into cars standing beneath.

The breaker is 51 feet high from the top of rails in the shipping tracks to the top of rails in the loading track above, and is approximately 22 feet in diameter over all. It was designed and installed by the Allis-Chalmers Co., Milwaukee, and has a 48-inch opening at the throat.

The top shell is extra heavy, with a recessed flange at the top for the reception of the spider. The joint between the top and bottom shells is tapered and turned to fit. Both top and bottom shells are flanged and heavily reinforced with wide ribs. The concaves are sectional, built in four parts, each section being independently replaceable. They are supported at the bottom by a sectional, removable iron ring and can be replaced without disturbing the spider. The diaphragm and inner sides of the shell are lined with removable hard iron wearing plates. The spout which delivers the crushed material to the screen is hard cast iron bolted to the shell. The bottom and the two sides of the spout are cast separately and bolted together so that any of the three pieces may be replaced

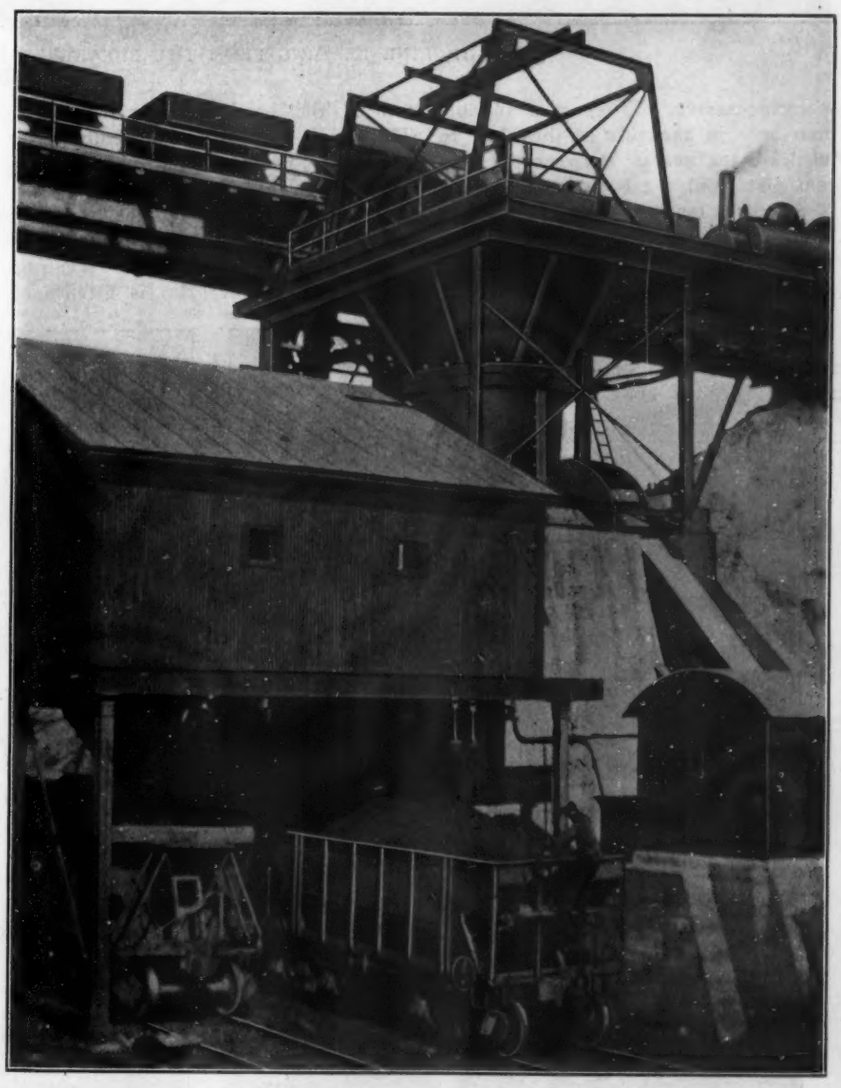


FIG. 1—LARGE BREAKER INSTALLED AT THE BIWABIK MINE. THIS VIEW SHOWS THE MINE CARS ON THE TRESTLE DISCHARGING THE ORE INTO THE BREAKER AND THE FREIGHT CARS RECEIVING THE CRUSHED ORE, ON THE LOWER TRACK

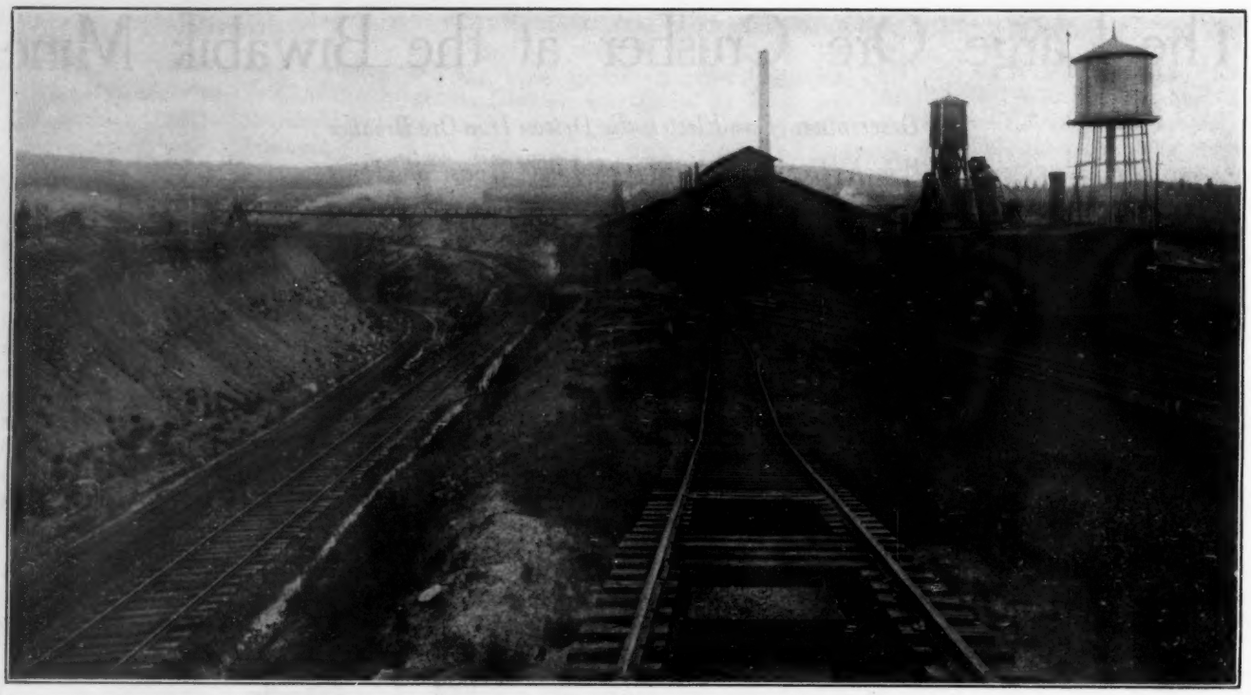


FIG. 2—INCLINE LEADING FROM THE BREAKER INTO THE PIT

when necessary. There is a suitable man hole in the side of the shell to lubricate the gears. Between the bottom plate and the bottom shell there is a heavy, tapered joint.

The spider of the breaker is in the form of a high curved arch, which is set with ample clearance over the top of the head and the concaves. This high arched construction prevents any of the ore from bridging as it passes into the machine. As the ore does not pass over the arms or the rim of the spider, it is unnecessary to protect them by wearing plates. The spider rim is fitted into a recessed flange in the top shell, and is thus held securely in place. The rim of the spider is not continuous, but has tapered wedges between sections, which construction is much more solid than if the rim were continuous, and eliminates the internal strains found in continuous rim spid-

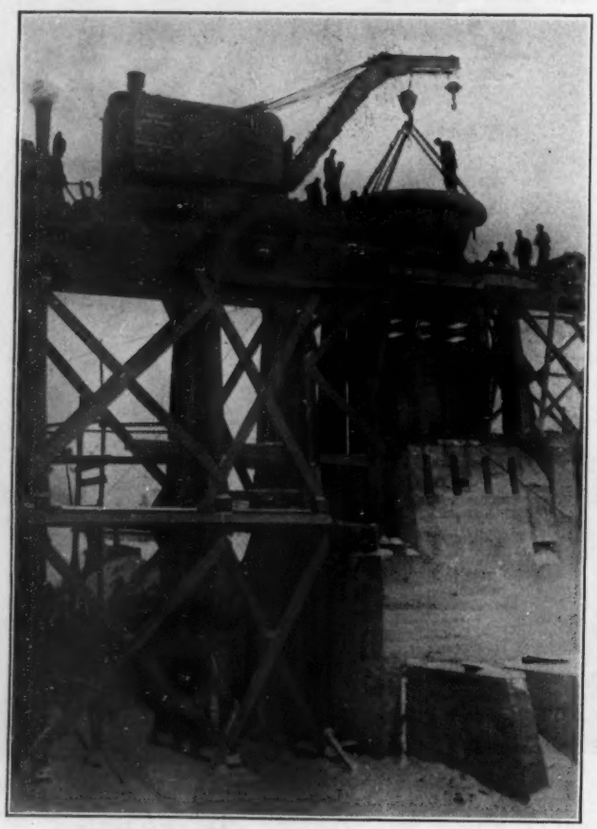


FIG. 3—ASSEMBLING THE BREAKER

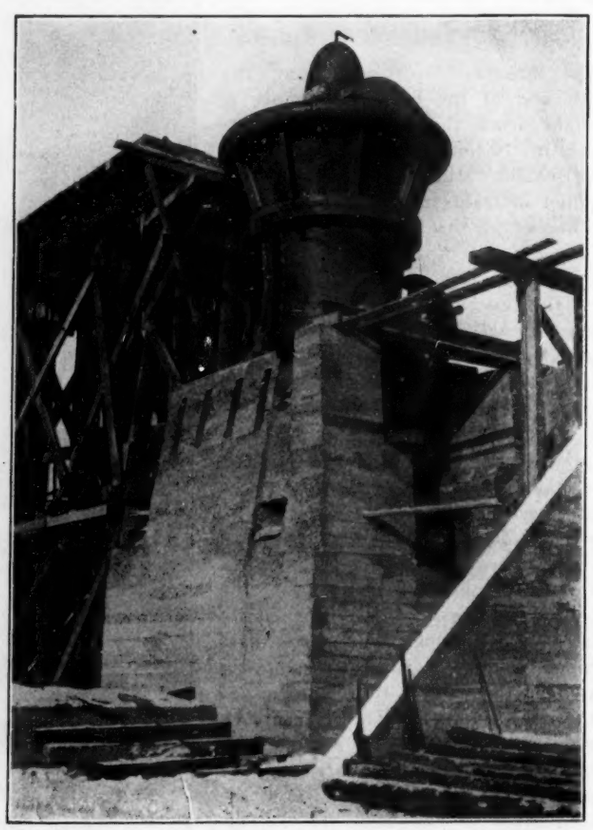


FIG. 4—ANOTHER VIEW OF THE BREAKER, SHOWING THE FOUNDATIONS

ers. There are no pockets in the under side of the arms in which the ore can catch. The head of the spider is fitted with a removable bushing having a tapered fit.

Above the spider is a two-part dust cap and it is only necessary to remove the upper and lighter part in order to inspect the top journal and the suspension device. The dust cap is well above the material being fed into the machine.

The main shaft of the breaker is hard steel, hollow-bored to remove center cracks in the forging, which, if not taken out, would tend to creep toward the surface. At the point where the head is fitted on, the shaft is enlarged and fitted with two key seats. The head is bored for its full length in order to fit the shaft and is set in place with two zinc keys and held down by a ring nut.

The self-suspension device consists of a bushing fitted to the hub of the spider, the upper part of which is spherical. Over this bushing a crucible steel wearing ring is mounted, the under side of which is turned spherical to correspond with the upper spherical surface of the spider bushing. The upper side of the wearing ring is flat. The suspension collar, made in two parts, is clamped to the shaft and rests on the upper flat surface of the wearing ring. It is prevented from rotation by two feather keys.

The countershaft is extra heavy to avoid deflection and its outer end is fitted with an outboard bearing. It is self-oiling and mounted on an iron sole plate.

The machine is belt-driven by a 200-horsepower, 3-bearing, Allis-Chalmers induction motor, running 570 revolutions per minute. The pulley on the motor shaft is 34 inches in diameter with a 20-inch face. The pulley on the driving shaft is 70 inches in diameter and, therefore, runs about 275 revolutions per minute. The driving pulley has double arms and a clamped hub keyed to the shaft.

For handling the heavy parts of the breaker a 24 x 24-inch friction hoist, belted to the drive shaft, is installed, as indicated in Fig. 5. A ⅝-inch cable from this hoist leads over a 36-inch sheave at the top of the machine and thence to a 10-ton block.

The various oil chambers are drained and the overflow oil is conducted to a tank. Capillary oil circulation is provided for the eccentric and main shaft journals. Large oil holes are cast in the top of the eccentric to allow the oil, which rises from the main shaft journal, to flow back to the reservoir underneath the shaft. The oil may be pumped through the machine or poured in the hollow shaft at the top.

The revolving screen, which is shown clearly in Fig. 5, is 72 inches in diameter and 13 feet in length. It is driven by a 30-horsepower, back-geared induction motor, running 900 revolutions per minute. The screen revolves about 17 revolutions per minute and is set with an inclination of 1¼ inches per horizontal foot. The two shipping bins underneath the screen, one of which carries small and the other large pieces, are each provided with 15 x 15-inch, self-closing gates, operated by levers from a platform or pulpit built at one side of the tracks.

Power for the operation of the breaker is furnished by an Allis-Chalmers 22 x 36-inch, simple engine, direct-connected to a 300-kilowatt, 3-phase, 60-cycle, 2,300-volt generator. The motors at the crusher operate

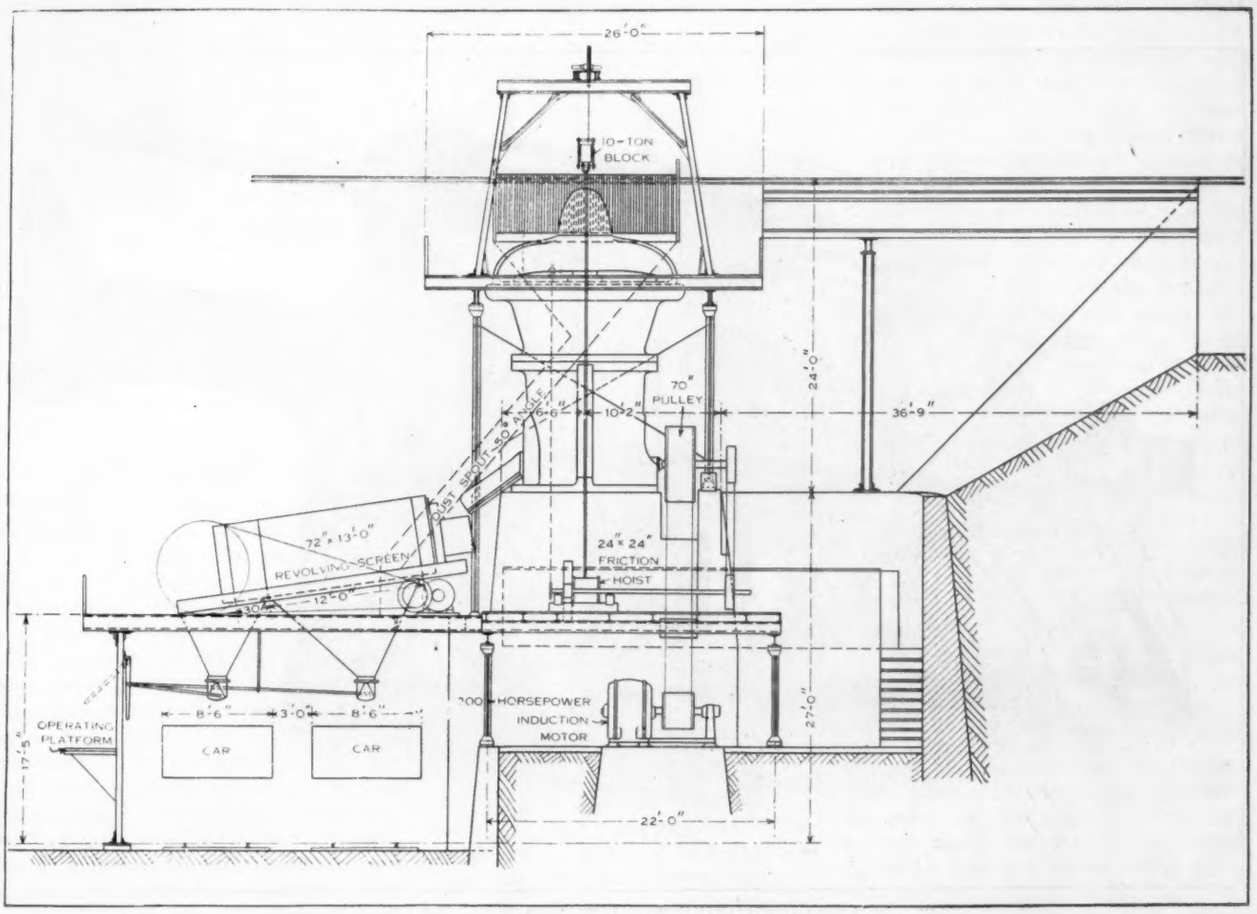


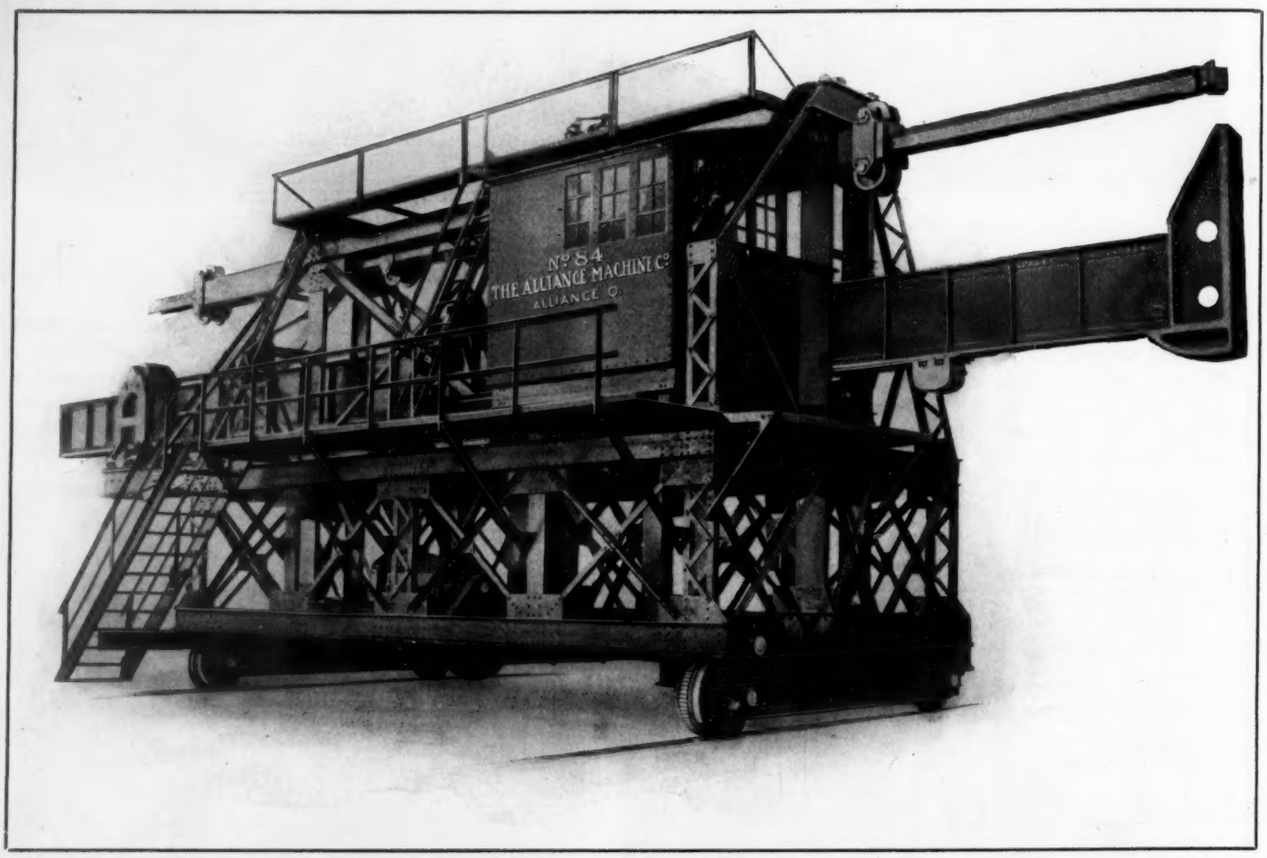
FIG. 5—GENERAL PLAN OF THE BREAKER

on the 2,300-volt circuit, no transformers being employed. Allowance, however, is made for a line drop of 100 volts. This power plant also furnishes the lights for the village of Biwabik. Steam is made in four 72-inch x 18-foot horizontal return tubular boilers, rated at 150 horsepower each at 100 pounds per square inch pressure. Screened lump coal is burned, which has been found more satisfactory than the ordinary run-of-mine coal generally used in mining power plants on the iron ranges.

The Brass Foundry & Heating Co., Peoria, Ill., has changed its name to the Brass Foundry Co.

Appalachian Coal Production in 1911

The condition of the coal mining industry of the Appalachian coal fields in 1911, was far from prosperous, owing to over-production and depressed prices, states Edward W. Parker, of the United States Geological Survey. The Appalachian region as the principal source of coking coals was more directly influenced by the depression in the iron trade in 1911 than some of the other coal mining districts. In some of the coking districts many of the ovens were shut down throughout the year. The production of coke in the Connellsville district decreased about 15 per cent, and the other coking districts will show a still larger falling off. It is estimated that the production of bituminous coal in Pennsylvania in 1911 decreased about 3 per cent, with a considerably larger decline in value. In West Virginia the production was approximately the same as in 1910. During the first six months of the year the production fell off approximately 3,000,000 tons, as compared with the last six months of 1910, but after the first of July, there was some improvement in business, although prices were still depressed.



A COMBINED COKE PUSHER AND COAL LEVELLER

Coke Pusher and Coal Leveller

The combined coke pusher and coal leveler, illustrated herewith, is one of four machines recently built for the Tennessee Coal, Iron & Railroad Co.'s Koppers by-product coke oven plant at Cory, Ala., by the Alliance Machine Co., Alliance, O. The machine has some unique features of design and construction, notably the placing of the coal leveler directly over the coke pusher ram; the cage is so arranged that the operator is directly over the pusher ram and under the coal leveler, thus giving him a clear view and, consequently, perfect command of both rams at all times. As both rams are in the same vertical plane, the operator can always spot the machine in the same relative position to the oven when he is pushing out the coke with the pusher ram, or leveling the fresh charge of coal. This construction also lends itself to the efficient system of bracing, as shown, making an absolutely rigid machine, and one well-adapted to take all shock incident to the operation of this class of machinery. The machine is driven by three alternating current motors of the mill type, and are each controlled with separate street car type controllers. The machine is of the steel and bronze type of construction, and all shafts are provided with bronze-lined capped bearings. The details of the machinery are worked out on the same general lines as that followed in the design of the modern steel works crane. The pusher ram has a stroke of 58 feet 6 inches; the leveler ram stroke is 48 feet 6 inches, and this ram is also adjustable 3 inches up or down from its normal position. The total height of machine from the rail to the highest point is 24 feet, and the distance from center to center of track rails is 30 feet.

United States Exports of Iron and Steel Products

By R. D. Williams

JOHN A. TOPPING

IN A recent interview, John A. Topping, chairman of the board of directors of the Republic Iron & Steel Co., Youngstown, O., said: "If the United States Steel Corporation does no more than further the export business of this country, as it has been and is doing, it has itself furnished one of the strongest possible arguments justifying its existence."

It is only of recent years that the foreign market has been cultivated for our iron and steel products. Even today the United States has but a relatively small share of this trade and would not even have that were it not for the foresight and splendid business intelligence of the Steel Corporation. This country is exporting over $2,000,000,000 in value annually, but only 50 per cent of it consists of manufactures ready for consumption, and hardly more than 10 per cent of it consists of iron and steel products. The foreign field for iron and steel products is, therefore, one of indefinite development. The uses of iron are said to increase in sort of a geometrical proportion to the increase of population. Certainly new uses for iron are developing daily and with the opening of new markets, notably China, the field becomes practically exhaustless. That the United States is not getting its share of this trade is clear. The world's export trade in iron and steel is about 14,000,000 tons a year, of which the United States has obtained approximately 1,500,000 tons. Based upon our world's percentage of capacity of 40 per cent, our export tonnage should be about 5,000,000 tons annually. It is clear that we are neither getting our share of this trade nor maintaining our position relatively with our two leading competitors, the United Kingdom and Germany, as the following comparable table will show:

IRON AND STEEL EXPORTS FROM:

	United States. Tons.	United Kingdom. Tons.	Germany. Tons.
1900.....	1,154,000	3,213,000	838,000
1910.....	1,535,000	4,594,000	4,868,000

It will be observed that the remarkable showing in this table is the German gain of about 600 per cent. The industrial advance of this nation under the constructive statesmanship of William II is well worth studying. The German emperor may be a war lord in the public prints, but he is first of all a business general. It is astonishing that Germany, scarcely as large as the state of Texas, should have grown in a decade into such a wonderful workshop. The reason will be found to lie in a sound governmental policy regarding industry. There can be no permanent prosperity in this country until the government's attitude towards business is defined, so that an enterprise that is started in good faith and with a decent respect for law shall be free from molestation.

The producing capacity of this country can never be employed to the full until it gets its just and legitimate share of the world's trade. There has got to be a lot of thinking done along this line and a lot of co-operation. As a nation we are in business, as individuals we are in business, simply to make money, and we should adopt those policies which serve to extend our legitimate functions in order that the gains of enterprise may be more widely distributed among our people. The nation is prosperous only as the individual is prosperous. A steady stream of outflowing goods means a steady stream of inflowing gold.

The English, of course, are very carping critics of our efforts to relieve over-production at home through the extension of our foreign markets, but whatever the English may say must not be taken too seriously. Considering the fact that they are a declining nation as far as total production goes, they succeed very well in getting more than their share of foreign trade. The English are very fond of saying that the United States dumps its surplus abroad at ruinous prices and there is really something to be said in justification of a policy of selling surplus at shop cost, since it tends to pay overhead charges and keep the shop busy; but the facts are that our goods frequently sell at export at higher prices than those charged domestic consumers. For instance, in 1911 the domestic price of barb wire was $1.85 at the mills, but the Steel Corporation's export price was $2. The domestic price of nails was $1.55; the foreign price at New York was $1.65. The price of standard steel rails to domestic buyers was $28 per ton. The price of American steel rails to consumers abroad was $31.70.

Reverting to Mr. Topping's article published in the Jan. 12 issue of the *Daily Iron Trade Review*, he says:

"It will be to the interest of all of our people to encourage by legislation and otherwise such practical measures as will tend to encourage foreign trade and the various manufacturing interests would in my opinion strengthen their exporting position by the formation of export selling companies."

It is, therefore, of interest to note in this connection that the Jones & Laughlin Steel Co., of Pittsburgh, has decided to make application during the present month for a charter for the Jones & Laughlin Steel Products Co. to handle the export business of that company. No departure from the established policy of the company is intended in this except that it has decided to handle exports as a unit separate from the domestic trade.

The bureau of statistics at Washington has lately been pay-

ing a great deal of attention to the export trade, which is certainly a step in the right direction. It is now issuing monthly to the trade a schedule of sailing dates, giving the departures of vessels from all American ports to foreign ports. The schedule is issued during the latter part of each month for the succeeding month and is, therefore, very useful to manufacturers.

The recorded value of iron and steel exports from 1900, given in Table I, shows that the United States has been making a fair growth, though not by any means what it should be. Looking backward, however, the figures do show that we are making progress, as the following comparative data for the past two decades shows:

1891.	1901.	1911.
$31,000,000	$117,000,000	$230,000,000

Comparing values, Great Britain exported $361,000,000 worth of steel products, exclusive of $16,000,000 worth of agricultural machinery from 1910, as against a total value of $339,000,000 in addition to $9,000,000 worth of agricultural machinery from Germany. The United States is third with $179,000,000 worth, exclusive of $30,000,000 worth of agricultural machinery. In the exportation of agricultural machinery the United States leads all other countries, not even the combined exports of the United Kingdom, Germany and France equalling it in this particular.

The United States is finding a market for its steel products in practically every part of the civilized world. An analysis of its 1911 exports, which are in excess of $230,000,000 for steel products and over $35,000,000 for agricultural machinery, shows that its steam locomotives and steel rails went largely to Canada, Mexico, Brazil, Argentina and Japan, where the rapid development of railways enabled an increased absorption of those materials. Structural iron and steel of American manufacture is being utilized in increasing quantities by most of the leading countries of North America, as well as in Australia and Japan. The farms of Canada, Argentina, Brazil, Australia and New Zealand are requiring increasing quantities of American wire. Our sales of electrical machinery show a healthy expansion in such important markets as the United Kingdom and European countries, as well as the newer countries of the western hemisphere. The same is true of sewing machines, cash registers, typewriters and metal working machinery.

Reference to Table II will show in what quantities these several articles were exported. A particularly significant item is that of tin and terne plates, the exports of which are rapidly increasing. It is not so very long ago that every pound of tin consumed in this country was imported and the opinion was quite general that it could not be successfully manufactured here. Experience proves how foolish that contention was.

The figures given in the accompanying tables are for the fiscal year ending June 30. Information received from the bureau of statistics leads to the belief that for the calendar year 1911 our export trade in iron and steel products will reach $250,000,000, which will show a decided impetus of the last half of 1911 over the first half.

It is practically impossible to forecast the influence that the opening of the Panama canal in 1914 will have upon the export trade of the United States. As far as distance is concerned, it will put the Atlantic seaboard of the United States on a footing with Great Britain in reaching the markets of northern China and will, of course, give it a slight advantage in reaching the Japanese

The Question of Prices

Export Editor, THE IRON TRADE REVIEW:—

I beg to acknowledge receipt of yours of the 26th, enclosing copy of THE DAILY IRON TRADE REVIEW *containing Mr. Topping's remarks, which I have read with much interest. There is very little to be said in addition to what has already been said regarding the export business of the United States. We for years have made every endeavor to sell our products abroad, but invariably encounter competition which is most difficult to meet. At times we have been successful in securing the business, but only when we have been fortunate enough to make a price lower than the European manufacturers and on the next tender for similar material they make a further reduction. There seems to be no bottom to the prices which they are willing to make and it becomes, therefore, a question of policy as to how far the American manufacturers should go. I am referring particularly to countries which do not manufacture the material upon which we are quoting.*

In order to continue exporting material, it means that prices in the United States must be mainta ned at a considerably higher figure in order to make up the losses upon the export business. It has been argued that the greatly increased tonnage, permitting a mill to work to its fullest capacity, will enable the mill to produce the material at a lower cost, thereby benefiting the domestic consumer. While there can be no doubt that this fact is partially true, yet from our observation we find that other countries doing a large export business as well as the United States compel the domestic consumer to pay a considerably higher price. Therefore, countries which contain no manufactory, although consuming very much less material than the country in which the manufactory is situated, purchase at a price which is so low, as stated above, that it contains no profit. Under such conditions there can be no inducement to establish factories or mills in the countries deriving the benefits of export competition carried on between the United States and European countries who do manufacture.

I presume, these conditions do not apply to all branches of export business, but we are only able to consider the material in which we are interested.

For example, we would refer you to Canada. Rough tires are admitted into Canada free of duty, as it contains no mill for the manufacture of tires. It is, therefore, open to the competition of the world and tires are imported into Canada at figures considerably less than the cost of manufacture. Should a mill be established in Canada, it would be necessary that the Canadian government, assuming that conditions of labor were the same there as in the United States, place a duty upon rough tires which would enable the home industry to live.

Notwithstanding the above remarks, we are constantly endeavoring to increase our export business, at prices, however, which will not impose a penalty on the home consumer in the shape of a higher price that it may contain an increased profit to cover losses on the export business, giving due consideration to the increased tonnage which, of course, would come with the placing of such orders.

ROBERT RADFORD,
Secretary Standard Steel Works Co., Philadelphia.

Table I.

IRON AND STEEL EXPORTS.

Year.	Value.
1900	$121,913,548
1901	117,319,320
1902	98,552,562
1903	96,642,467
1904	111,948,586
1905	134,728,363
1906	160,984,985
1907	181,530,871
1908	183,982,182
1909	144,951,357
1910	179,133,186
1911	230,725,351

market. There is a field here of untold wealth to be exploited and one in which the ground has scarcely been scratched. With the awakening of China and its adoption of occidental customs, there will be a market in that country alone for every pound of surplus. At present the United States' share of this trade is not much, reaching only about $2,000,000,000 annually. The canal, too, will doubtless have a very wide influence upon the development of trade with the west coast of South America. The balance has always been against us in this quarter, though our exports are gradually overtaking our imports. However, the balance in favor of South America is still heavy, our exports for 1911 being $109,000,000 and imports $165,000,000. The countries, however, contiguous to the canal will also be developed in ways that are not now thought of, but there can be no development in which the uses of iron do not take a leading part. One of the surest ways to develop the South American market is to make the Panama canal free to American ships. The practical effect of this policy would be to extend our coastwise development. The United States has certainly earned its right to this extension and not to take advantage of it would be unspeakable folly.

The next issue of the Export Department will treat of the market lying to the south of us and the importance of the canal as the dominant factor therein.

Wake Up—Administration, Politician and All the People!

Export Editor, THE IRON TRADE REVIEW:—

Answering yours of the 18th, regarding export trade: Our company has for ten years enjoyed a limited trade of this character, only, because of the advanced state of certain metal-working machinery, and in no way brought about by competitive prices, and we know of other manufacturers who have had like trade due to the same advantage. This, however, is not true of many lines, which must compete in price with foreign producers.

So long as the American people, the politician and administration raise a hue and cry about selling for less for export than at home, and threaten all sorts of freak legislation to prevent this state of affairs, in the face of European governments paying bounties, reducing railroad rates to seaboard for export business, as is done in Germany, and perhaps other European states, so long will our country suffer a loss of export business.

Our surplus should go out of the country if it yield only cost of production. All this surplus will use our natural resources, give employment to labor, reduce the cost to home consumers, though it does not reward the manufacturer, except as to economical operation.

Wake up, administration, politician and all the people!

ISAAC W. FRANK,
President United Engineering & Foundry Co., Pittsburgh.

German Machine Tool Trade

In an address presented at a recent meeting of German Machinery Construction Works, Prof. G. Schlesinger, of Charlottenburg, discussed the position occupied by German machine tool makers in the markets of the world. An impartial investigation of the subject was made possible by the co-operation and support of the Verein Deutscher Maschinenbau Anstalten, and the Verein Deutscher Maschinenbau Maschinenfabriken, and the details, incorporated in the paper, presented a comprehensive view of the actual situation. A comparison of German machine tools with those made in other countries indicated that the trade contest is between Germany and the United States. The imports of tools from England into Germany consist largely of very heavy machines, whereas the American imports are almost entirely small and medium sized machines, in which the cost of labor constitutes the principal expense of manufacture. As a result, the importation of American machine tools into Germany lessens the opportunities for employment of the German worker to a much greater extent than the imports from any other country.

The exports of German machine tools, according to statistics for the past ten years, increased from 11,000 tons in 1900 to 58,000 in 1908, while the imports averaged 5,500 tons during the same period. The German exports of machine tools to England are greater than the imports from that country, but the German exports to the United States are inconsequential. It was suggested that the makers of German machine tools should do all in their power to reduce the cost of their product and improve the quality, so as to be able to compete in the American market. A comparison of the export and import statistics of Germany and the United States is the basis for the assumption that German makers can claim equality with the United States in most foreign markets, as other countries are large purchasers of German machines.

Table II.

CLASSIFICATION OF IRON AND STEEL EXPORTS.

Article.	Year 1910.	Year 1911.
Pig iron	$1,353,589	$ 2,473,130
Scrap	281,825	794,686
Bar iron	684,965	691,770
Bar or rods of steel	4,257,666	5,015,909
Steel rails	10,546,180	11,377,444
Billets, ingots, blooms	1,192,565	4,102,138
Sheets and plates, iron	5,860,526	6,545,585
Sh'ts and plates, steel.	6,120,065	8,563,840
Tin plates, terne plates	921,171	2,489,094
Struc. iron and steel	5,800,551	8,683,851
Wire	8,396,966	10,199,968
Builders' hardware..	14,160,439	17,064,813
Car wheels	410,291	367,453
Castings	2,061,028	3,213,737
Cutlery	906,683	1,083,891
Firearms	2,373,662	2,916,217
Electrical machinery	6,048,263	8,024,628
Laundry machinery..	831,614	1,233,613
Metal working mchy.	5,975,503	9,626,965
Mining mchy.	5,400,420	7,017,486
Printing presses	2,065,299	2,854,210
Pumps and pumping machinery	3,110,908	3,562,458
Sewing machines	7,513,852	9,039,840
Shoe machinery	1,239,789	1,633,670
Locomotive parts	2,404,619	3,953,648
Stationary engines..	3,098,785	4,042,793
Traction engines	2,333,803	3,627,837
Typewriters	8,239,510	9,778,498
All other machinery	22,247,535	24,497,744
Nails and spikes	2,725,034	3,536,590
Pipes and fittings..	9,574,748	10,735,167
All other mfrs.	30,995,332	41,976,678
Total products...	$179,133,186	$230,725,351

Will Make New Type of Lock

The Carroll Lock Co., Oakwood, Dayton, O., advises that it is the successor of the Carroll Engineering & Mfg. Co., Dayton. It will engage in the manufacture of combination locks for doors in residences, stores, etc., and also for use on safes, filing cabinets, safety deposit vaults, etc. The lock is free from tumblers, pawls, springs, etc., and is claimed to be absolutely positive in operation. The lock was designed by Thomas Carroll, for the past 15 years chief inventor of the National Cash Register Co. The new concern will take up quarters in the new Beaver power building, Dayton, pending the erection of a new building.

New Firm.—Chas. A. Reed and Albert S. Fears have formed a partnership under the name of Reed & Fears to deal in pig iron, coke and alloys and have opened offices in the Oliver building, 141 Milk street, Boston. Both partners have had many years experience in the iron business, the former with N. S. Bartlett & Co. and the latter with Hickman, Williams & Co.

Tests for Rolling Mill Power Requirements[1]

A Discussion of the Problem of Determining the Power for Steam Engine and Electric Motor-Driven Steel Mills

By B N Westcott

The power required in the mechanical reduction of steel has been the subject of considerable investigation in recent years, both in this country and in Europe. To secure data bearing on this subject, a great number of tests have been made in rolling mills under actual commercial conditions, and as a result a large amount of valuable information has been secured.

There are, of course, many different kinds of rolling mills, depending upon the character of the product rolled. Fig. 1 gives a brief summary of a few of them. The arrangements of the stands, dimensions of the steel rolled, etc., for the various mills should not be considered as fixed for any one type of mill, as different companies use various modifications of the arrangements shown; but the tabulation will enable a good general idea to be formed of the various classes of rolling mills.

Representative classes of Rolling Mills, showing sequence of operations

Rail Mill	Cogging or Blooming Mill	Billet Mill	Rod Mill	Plate Mill	Merchant Mill	Sheet Bar Mill	Sheet Mill
Ingot Cast 19"x19"x46"	Ingot Cast 19"x19"x46"	Blooms received direct from blooming mill without reheating	Billets 4"x4"x72"	Slabs. Various dimensions Approx. 20"x20"x4"	Billets 4"x4"x72"	Billets 6"x6"x40"	Bars 8"x30"x1"
Reheated in Soaking Pits	Reheated in Soaking Pits		Billets heated in Furnaces	Reheated in Furnace	Reheated in Furnace	Received hot from Steam Hammer or Billet Mill	Reheated in Furnace
1 Blooming Stand	Blooming Stand	Continuous Mill 2 high stands	Continuous Mill 2 high stands	2 high reversing or 3 high mill. "Universal" Mill has side rolls for finishing edges of plate. Shear Plate Mill has no side rolls and leaves edges unfinished.	Continuous Mill 2 high stands	6 Roughing 4 Finishing Passes 2 high stands	Roughing Finishing Both are 2 high stands with screw down rolls
Bloom Shears	2 high reversing or 3 high mill Screw down rolls					Sheet Bars 8" wide, ½ to 1" thick, 20 to 50' long	Sheets from .05" to .01" thick. Rolled in packs of 2, 4, 6 or 8 sheets
3 to 6 Roughing Passes	Bloom Shears					Shears	
7 to 10 Intermediate Passes	Blooms 9"x9" Sq.	Flying Shears			2 high finishing stands		Shears
11 to 15 Finishing Passes			2 high finishing stands	Plates ¼" to 2" thick	Angles or other small structural shapes		Cold Rolls for Finishing
Hot Shears			Rods reeled or put on cooling beds	Straightening Rolls	Cold straightening rolls		
Cambering Rolls			Shears	Shears	Shears		
Cooling Beds			Finished Bars, Rounds from ⅜" to 1½" Diam. and small Flats.				
Cogging Hammers							
Drill Presses							
Finished Rails							

Dimensions given are approximate

FIG. 1—BRIEF SUMMARY OF DIFFERENT ROLLING MILLS, SHOWING THE VARIOUS SUCCESSIVE OPERATIONS

With regard to testing, rolling mills may be divided into two classes, steam-driven and electric-driven. The same information is sought in testing either type of mill, but the methods of test are somewhat different. In both cases we wish to determine the power that is required to roll a piece of steel of a given sectional area and length, to a smaller section of increased length, in a definite time.

As several passes are usually required to effect any considerable reduction, the total horsepower-seconds represent the energy required for this work. If there is no flywheel effect in the system, the power developed by the prime mover while the steel is in the rolls is the actual power required to turn them. This condition is approximately realized when the steel requires 8 to 10 seconds to go through the rolls, so that even though there be a flywheel connected, its energy is entirely given up before the pass is completed and the total torque required to turn the rolls must be furnished by the prime mover.

When, however, there is considerable flywheel effect present and the passes are of short duration, the power developed by the prime mover while the steel is actually in the rolls may be only a small fraction of the total power required, the remainder of the power being supplied by the flywheel. With steam engine drive the proportion of the total power that is furnished by the flywheel is determined by the speed regulation of the governor, as there is a tendency toward a large drop in speed as the load comes on the throwing load on the flywheel; while with electric motor drive the amount of power supplied by the flywheel is determined by the regulation of the motor, in other words, its tendency to drop in speed as it is loaded up.

In any case, the total horsepower-seconds furnished by the prime mover will not be materially altered, because when a flywheel is used, power will be required for acceleration after the steel has gone through the mill. However, in many instances we desire to determine the actual torque required to turn the rolls while the steel is passing through them. If the total horsepower-seconds necessary for a given pass be divided by the time in seconds during which the steel is actually in the rolls, the power required to turn the rolls will be determined. A rough check on this figure can be made by determining the horsepower-seconds given up by the flywheel in slowing down.

If

N_1 = revolutions per minute at start of pass

N_2 = revolutions per minute at end of pass

I = moment of inertia of flywheel.

$$\text{Horsepower-seconds} = \frac{I \times (2\pi)^2 (N_1^2 - N_2^2)}{2 \times 3600 \times 550}$$

$$= 0.00000997 \times I\,(N_1^2 - N_2^2)$$

[1] From the *General Electric Review*.

For the various classes of mills, changes in detail arrangements for testing must be made and these will be taken up under the headings of steam and electrically-driven mills.

In steam-driven mills, one of the first essentials is to secure a good record of the horsepower developed by the driving engine while the steel is being rolled, and the best way to do this is to use a continuous drum steam engine indicator. This differs from the ordinary steam engine indicator in that the paper on which the indicator card is made is a long continuous strip, which is reeled inside the drum and feeds around the drum ¼ inch at each stroke of the engine. Fig. 2 shows the general layout used in testing steam-driven mills, and a description of the methods and apparatus used will now be given.

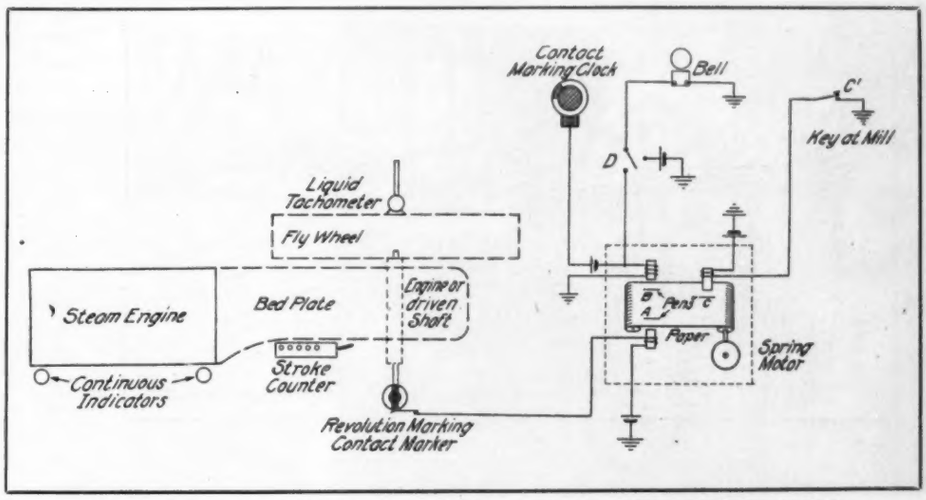


FIG. 2—GENERAL LAYOUT FOR TESTING STEAM ENGINE-DRIVEN MILLS

A recording instrument for speed, time and general information regarding work in the mill is used, which consists of pens, actuated by magnets, that mark on a strip of paper which is moved at a uniform rate beneath them by a spring motor. In most cases three pens are used, *A*, *B* and *C*, Fig. 2; *A* is actuated by a contact maker, which is driven from the engine shaft or other convenient place so as to complete the circuit of magnet *A* several times for each revolution of the engine, the number of contacts per revolution depending on whether the engine is high or low speed. Pen *B* is controlled by a contact-making clock, which is regulated to close the circuit of *B* once in every five seconds or at shorter intervals if preferred. In addition to actuating *B*, the contact-making clock also closes the circuit of an electric bell, or in some cases that of an electrically-operated whistle. The third pen, *C*, is controlled by a manually-operated key located at the rolls.

In addition to the above a liquid tachometer, consisting of a small centrifugal pump which raises a column of colored alcohol to a height depending on the speed at which the pump is driven, is used to indicate speed variations of the engine. A stroke counter is connected to the engine to record strokes and furnish a check on the graphic instrument.

The equipment described will enable an accurate record to be determined of the power that is furnished the mill, but the work the mill is performing must be noted by other means. In mills where the engine drives one set of rolls, and where the rolls are screwed down between passes and the ingot is reduced in the one stand by passing back and forth, the reduction data is secured as follows:

The weight of the ingot being known, and also the weight of a cubic inch of the steel being rolled, the volume of the ingot is calculated and is made to serve as a check on the reduction measurements. Before the first pass the length of the ingot is measured with a hooked iron rod. The length is taken after each pass, and in addition, measurements of the width and thickness are made with calipers. The three measurements at each pass should check with the original volume.

Where the engine drives more than one stand it will be necessary to have measurements of the steel taken at each stand. In many mills to be found in commercial operation, steel may be in two or more stands at one time, all of the stands being driven by one engine. In such cases, if tests are being made simply to determine the power required by the mill as a whole, it will only be necessary to note what stands are occupied at any particular time and have observers at each stand to make the reduction measurements. However, in tests where the main object is to accurately determine the power required to reduce the size of a definite weight of steel by a given amount in a certain time, it is well to arrange to have only one stand occupied at one time. Most tests on steam-driven mills are made with the first object in view, that is, to determine the total power required by the mill with an aim to supplying a satisfactory motor to replace the engine. The data on the steel which is being rolled is recorded merely to serve as

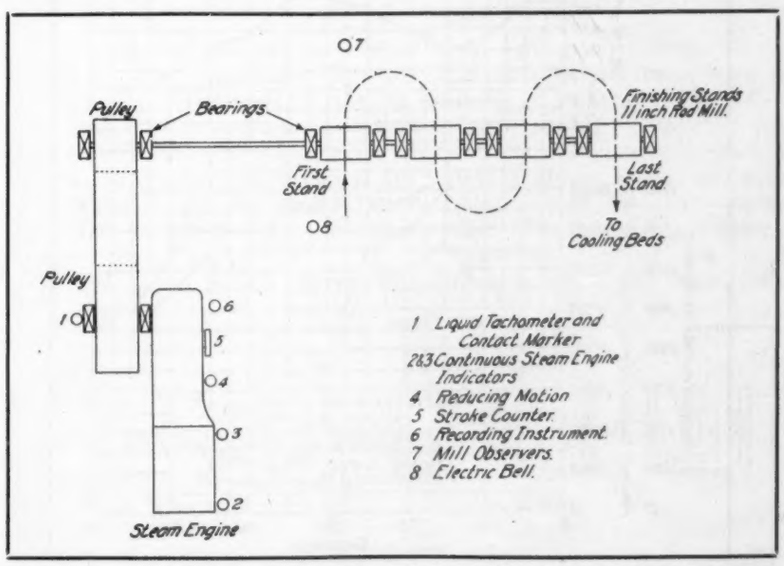
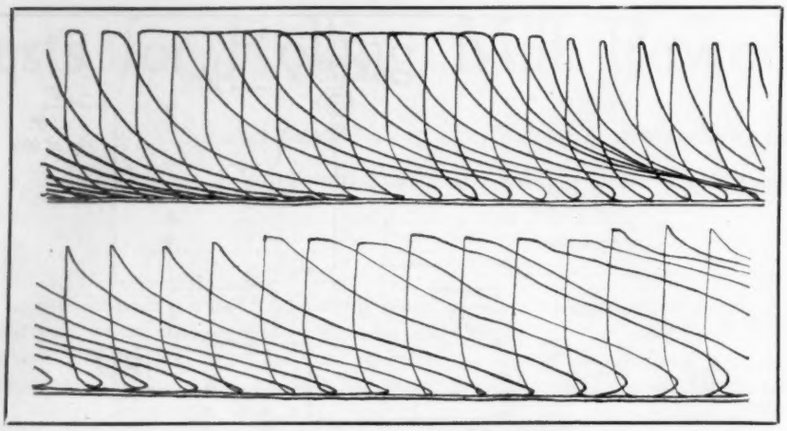


FIG. 3—ARRANGEMENT OF FOUR FINISHING STANDS OF AN 11-INCH ROD MILL

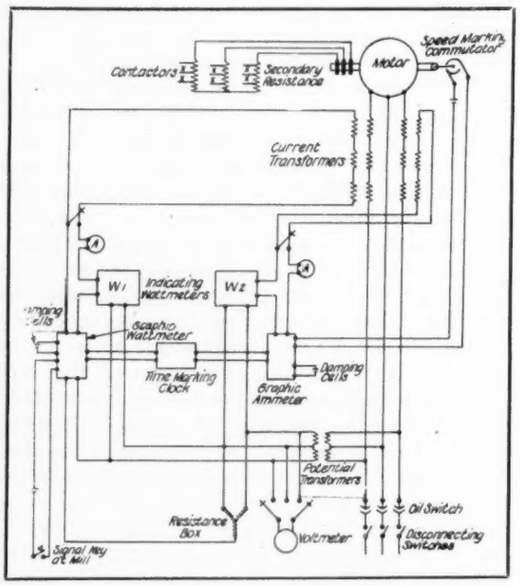


FIGS. 4 AND 5—STEAM ENGINE INDICATOR DIAGRAMS. FIG. 4 IS THE UPPER DIAGRAM AND FIG. 5 THE LOWER ONE

a means of definitely determining the duty which the mill is performing. In most cases where a mill is made up of several stands driven by a number of different engines, it is best to test one engine at a time, in order to avoid impeding the output of the mill and also to reduce the number of men and instruments required for the tests. The methods used are best outlined by a description of the actual details of a rolling mill test.

Fig. 3 shows the layout of the four finishing stands of an 11-inch rod mill. In rolling the smaller sizes of steel, the rod is passing through all four stands at once, while in some of the larger sizes perhaps only two of the stands will be occupied by the same rod at the same time. At *1* is located the liquid tachometer and the contact-maker, both of which are attached to one end of the engine shaft; *2* and *3* are the continuous indicators, one for each end of the engine; *4* is the reducing motion of the indicators, in this case consisting of an inclined plane fastened to the crosshead, on which rests a steel roller supported from one arm of a bell crank lever. As the crosshead moves back and forth, the roller moves up and down on the inclined plane, this vertical motion being converted into horizontal motion by the bell crank lever and transmitted to the indicator. A stroke counter, *5*, is actuated from the reducing motion, and the recording instrument previously described, shown in Fig. 2, is located at *6*; *7* is an observer stationed at the mill and having in his hand the key, *C*, Fig. 2, while *8* is an electric bell.

When the man in charge of the test has seen that the observers are in their places and that steel such as desired is coming through the mill, he rings the bell with a predetermined signal to warn the observers to get ready. He then throws switch *D*, Fig. 2, on the contact controlled by the clock, and the observers proceed as follows: The man at *1*, Fig. 3, reads the liquid tachometer every time the bell rings, that is, every five



7—WIRING DIAGRAM FOR TESTING ELECTRICALLY-DRIVEN SHEET BAR MILL

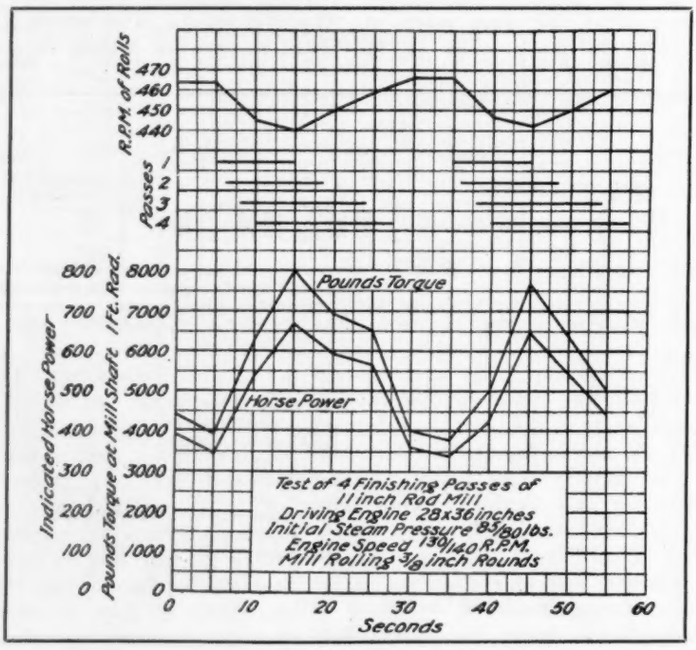

R.P.M. of Rolls
Passes
Indicated Horse Power
Pounds Torque at Mill Shaft per 1 Ft. Rod.
Pounds Torque
Horse Power
Test of 4 Finishing Passes of 11 inch Rod Mill
Driving Engine 28x36 inches
Initial Steam Pressure 85/80 lbs.
Engine Speed 130/140 R.P.M.
Mill Rolling 3/8 inch Rounds
Seconds

FIG. 6—CURVES FROM DATA SECURED IN TESTS OF AN 11-INCH ROD MILL

seconds. The men at the continuous indicators, *2* and *3*, have their indicators in working order, the reducing motion connected and, in fact, everything but the continuous feed operating. When the bell is first rung by the time clock, the feeds on both indicators are started simultaneously and from then on the indicators automatically record the torque developed by the engine. The stroke counter is read and a record made by a man at *5* every time the bell rings. The recording instrument at *6* has been making a chart of engine strokes against five-second intervals, and from these stroke records the speed of the engine at any instant may also be scaled off. In addition, the observer at *7* has been signaling by his key the instant at which steel enters each pass, and this has been recorded on the chart and is an accurate record of the location of the steel in the

mill against time in seconds from the start of the test.

The graphic speed record, the tachometer readings and the stroke counter serve to check one another, and from them sufficient data may be obtained for calculating the flywheel torque developed, in case the flywheel effect is sufficiently great and the character of the load is such as to make it worth considering.

In a mill of this type, the rolls are set by trial at first, and when once the correct setting and reduction for each pass have been obtained, the rolls are not changed while the size of steel that is rolled remains the same—which may be several days, or perhaps only six or eight hours. Because of this fact, it is comparatively easy to get the reduction of the steel per pass. Before the first pass a sample is sheared from the rod and likewise after each of the passes, and from these samples the reduction may be determined.

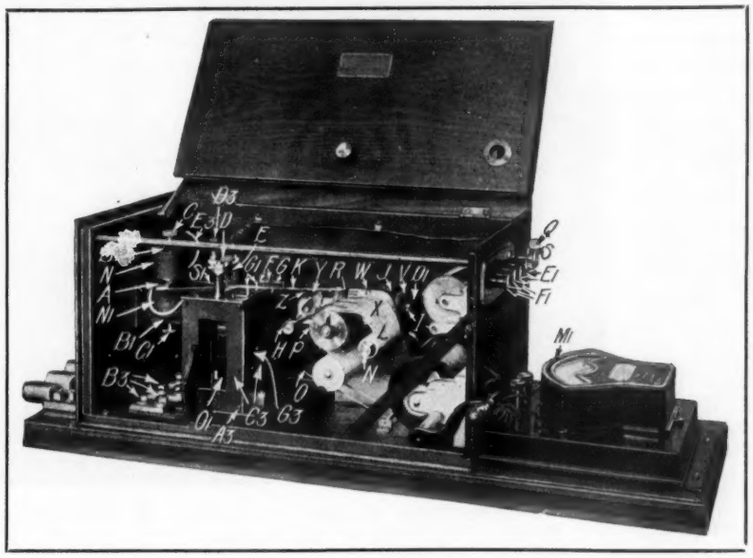


FIG. 8—GRAPHIC WATTMETER

The temperature of the steel affects to a great extent the power required for rolling. It is, therefore, the usual practice to make temperature measurements of the steel by means of a pyrometer. The best pyrometer for this purpose is some form of the spectrum or color type, where the color of the steel is compared with another color, such as incandescent lamp filament, and the temperature determined from experimental data and tabulations. Another scheme is to focus the rays of light from the steel on a thermal couple, which is connected to a galvanometer calibrated to read temperature.

Figs. 4 and 5 show portions of continuous indicator cards from steel mill tests. Fig. 4 was taken from a 44 x 60 simple Corliss engine driving 12 stands of a continuous rod mill. The instant at which the steel enters the rolls is distinctly shown by the point where the engine begins to take increased steam. For about 12 strokes the engine does useful work and then drops back to friction load. Fig. 5 shows cards taken from a 28 x 36 simple slide valve engine driving the four finishing stands of an 11-inch rod mill. The cards show what a large proportion of the total power developed by the engine was used in overcoming friction and other losses. This engine ran at 130 to 140 revolutions per minute and was belted to the mill shaft so that the latter ran at 440 to 470 revolutions per minute.

In Fig. 6 are plotted curves from

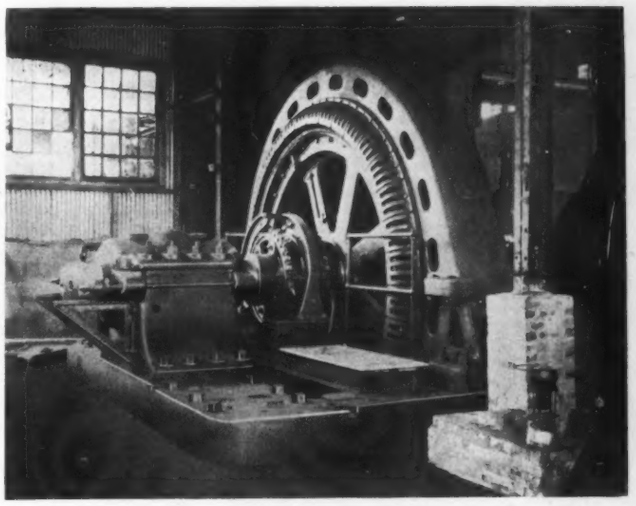


FIG. 9—THE 1,000-HORSEPOWER INDUCTION MOTOR DRIVING THE 20-INCH BAR MILL

data secured in one of the tests of the 11-inch rod mill mentioned. The top curve is the roll speed in revolutions per minute, and below it is a graphical representation of the passes occurring in the mill at any instant. For instance, the rod entered pass *1* at five seconds, and the last end passed out from stand *1* ten seconds later; the head end in the meanwhile having entered stand *2* at six seconds, stand *3* at eight seconds, and so on. During the period from 10 to 15 seconds all the stands were occupied.

The next curve shows the pounds torque at one foot radius that was developed by the engine at the mill shaft, and beneath the torque is a curve of horsepower determined by combining the torque and speed curves. By a consideration of all of these curves the proper size of motor to replace the engine may be determined.

In testing electrically-driven mills, the conditions are much more favorable for a close determination of the power required to reduce steel than in steam-driven mills, because of the great accuracy of electric meters as compared with the steam engine indicator. The information obtained from testing motor-driven mills is of extreme value in estimating the size

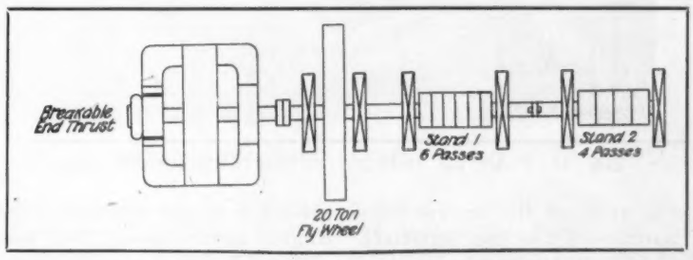


FIG. 10—PLAN OF THE 20-INCH BAR MILL

of motors required in new mills or in mills at present driven by engines, where a certain tonnage for the mill is given, together with information as to the dimensions of steel rolled, number of passes, roll speeds, etc.

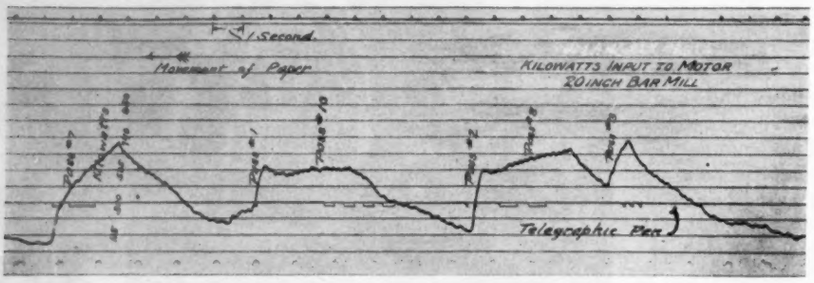


FIG. 11—GRAPHIC WATTMETER RECORD TAKEN ON MOTOR SHOWN IN FIG. 9

The rolling motor may be designed for either direct or alternating current, the majority installed today being of the latter type. We will, therefore, outline first the methods used in working with alternating current apparatus.

Fig. 7 shows the wiring used in testing an electrically-driven sheet bar mill.

bar mill. This mill is two-high, with rolls from 16 to 20 inches in diameter, and is driven by an induction motor of 1,000 horsepower, 83.3 revolutions per minute synchronous speed, operating from 2,200-volt, three-phase, 25-cycle mains.

The power required to drive the mill is recorded by a graphic wattmeter similar to that shown in Fig. 8. This is a single-phase instrument, but is calibrated to record three-phase power, its voltage coil receiving potential across a Y resistance box. To check the recording wattmeter, single-phase indicating wattmeters are used, together with indicating ammeters; potential transformers stepping the 2,200-volt supply down to 110 volts, and current transformers of suitable ratio being used for the current coils of the wattmeters and the ammeters. Each of the graphic meters is provided with two pens in addition to the main pens for recording power and current. On the graphic wattmeter one pen is connected to the time-marking clock and spaces off equal time intervals, while the other pen is controlled by a key located at the mill. In the graphic ammeter one pen is likewise connected to the time-marking clock and the other in circuit with the speed-marking commutator, which is connected to one watt-end of the motor shaft.

A voltmeter is wired in circuit as shown, so that voltage between any two lines can be read; and in addition to the above equipment, a liquid tachometer is used to indicate the motor speed.

The motor is started up with all resistance in the secondary, and as it comes up to speed, the contactors close and short circuit portions of the resistance, bringing the motor nearer to synchronous speed. Sufficient resistance remains permanently in the secondary circuit to cause a considerable drop in speed from no load to full load, thus allowing the 20-ton flywheel to take some of the peak power demands.

The steel is rolled as follows: A billet about 5 feet long and 6 inches square is brought to the first pass on stand No. 1 and sent through the rolls. It is caught on the other side, returned over the top of the rolls, and sent through the second pass. This procedure is kept up until the last pass, when the billet has been reduced to a sheet bar about ½ inch thick and 40 feet long.

When the mill is in regular commercial operation, as many as three billets may be in the stands at once, but in most of the tests that were made, it was decided to have only one billet in the mill at a time. With this understanding the mill was tested as follows:

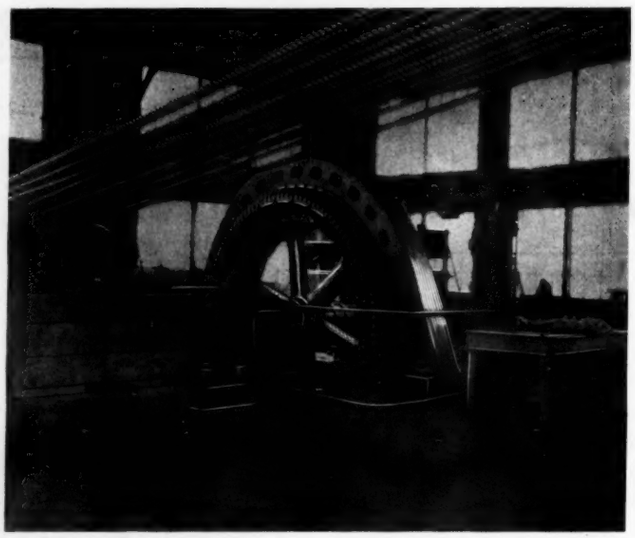


FIG. 13—INDUCTION MOTOR, DRIVING A 30-INCH, FOUR-STAND SHEET MILL

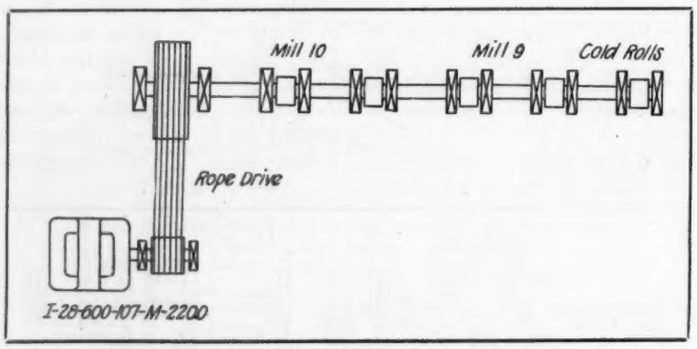


FIG. 12—PLAN OF 30-INCH, FOUR-STAND SHEET MILL.

Just before the billet entered the first pass, the spring motors on the graphic meters were started, the short-circuiting switches on the secondaries of the current transformers opened and the time-marker clock started. At each pass from then on, these instruments recorded kilowatts and amperes input to the motor, speed and time, and the man at the mill signaled just what passes were occupied at any instant. As the billet went through each pass, the speed dropped and a man at the liquid tachometer noted the high and low speeds of the motor. In addition to these records, readings of voltage were taken, while two men took measurements of the billet at each pass, using calipers for

width and thickness and a hooked iron rod for length. The recording instruments were checked with the graphic meters, by taking simultaneous readings during a long pass when the input to the motor was steady for a sufficient length of time to permit of good readings being secured.

In working up the data obtained, the characteristic curves of the induction motor were calculated. For any given pass the graphic records showed the kilowatts input to the motor, the time of the pass and the drop in speed. The size of the flywheel was known, and, therefore, the value of all the factors for substitution in the formula.

$$T = T_1 - \frac{T_1 - T_0}{eAt}$$

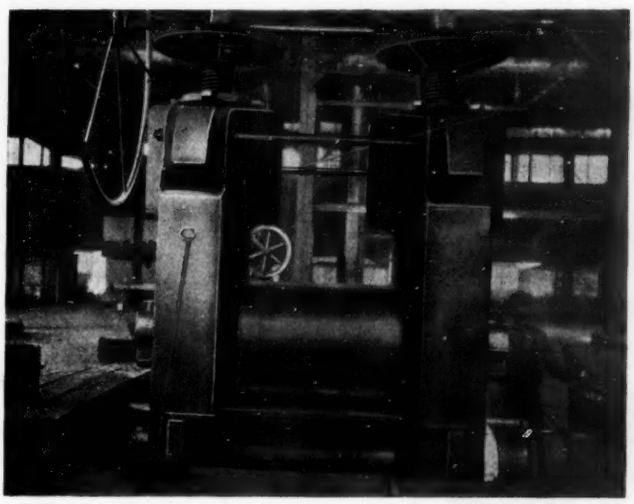


FIG. 14—ONE STAND OF ROLLS, 30-INCH SHEET MILL

Where

$$A = \left(\frac{308\,T}{WNS}\right)$$

T = Motor torque at any time
T_1 = Total torque of the load
T_0 = Initial torque of the motor at zero time
N = Synchronous speed in revolutions per minute.

When the total torque required in reducing the steel has been determined, curves of torque at each pass may be plotted against time, and from these, curves of horsepower-hours per ton against per cent elongation can be laid out. The latter curves are extremely useful in estimating the power requirements of future mills.

With direct current motor-driven mills, the testing apparatus and methods are very similar to those used for induction motor-driven mills, with the exception that no potential or current transformers need be employed. The recording meters are similar in appearance to the alternating current meters.

Figs. 9, 10 and 11 relate to the test of a 20-inch bar mill. Fig. 10 is a plan view of the mill and Fig. 9 shows the driving motor. Fig. 11 is a graphic wattmeter record from a test made while the mill was in commercial operation. The first peak on the record was caused by steel entering pass No. 7. This pass required about three seconds, and the manner in which the

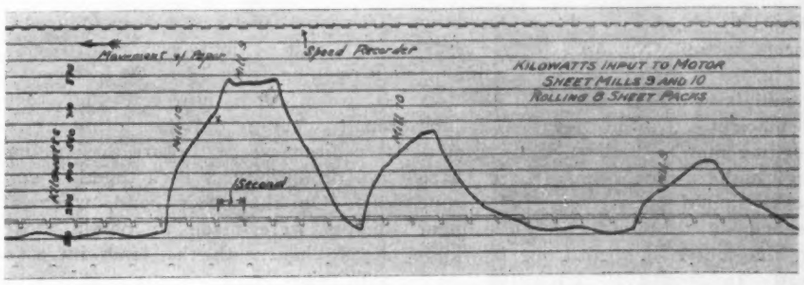


FIG. 15—WATTMETER RECORD OF POWER SUPPLIED TO TWO MILLS

flywheel took the peak load, causing the input to the motor to increase comparatively slowly and likewise decrease slowly, is clearly shown. The next peak was caused by steel in pass No. 1, and then a bar which had been waiting was sent through the mill for its last, or tenth pass, and so on as noted in the curve. At the top of the sheet the time is marked off in seconds and below may be seen the record of the telegraphic pen. The speed-marker record is on the graphic ammeter chart, which is not shown.

Figs. 12, 13, 14 and 15 relate to a test of a 30-inch, four-stand sheet mill. Fig. 12 shows the layout of the stands, motor drive, etc.; Fig. 13 illustrates the motor driving this mill; Fig. 14 is a detail view of one of the stands of rolls; and Fig. 15 is a portion of a graphic wattmeter record made while mills Nos. 9 and 10 were in commercial operation. The speed marker is shown at the top of the record, and time intervals below. The telegraphic pen in this case was on the graphic ammeter record. The first peak was made exceptionally heavy by reason of the fact that a pack of steel sheets in mill No. 10

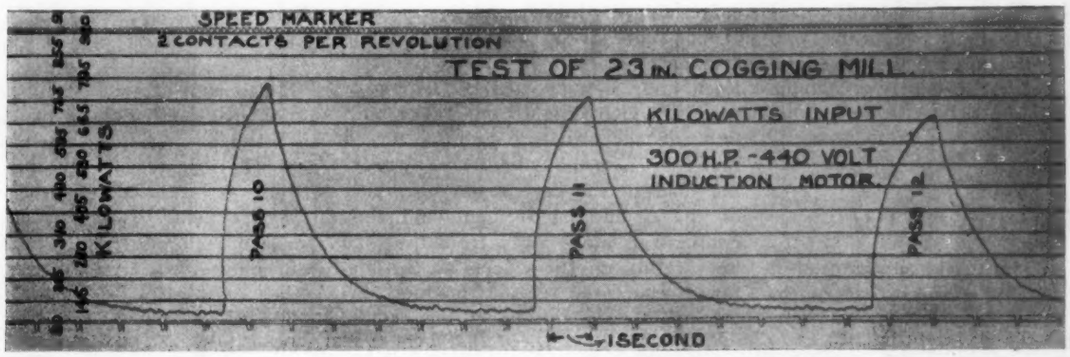


FIG. 16—EXAMPLE OF INSUFFICIENT FLYWHEEL EFFECT

E = Base hyperbolic log = 2.718
T = Motor torque at slip s
W = Flywheel effect in pounds at one-foot radius
S = Slip at torque T

pulled the speed of the mill down, and before the motor had time to accelerate, another pack was sent into mill No. 9, the result being that the

motor had a dead drag of about 800-horsepower to pull through. The difference in character of the load on the motor when the flywheel is able to supply part of the torque is well shown by the next peak, produced by sheets in mill No. 10.

Fig. 16 is given as an example of a mill in which the flywheel effect is insufficient. The mill was a 23-inch cogging mill, with short passes requiring high torque. The very sharp peaks should be noted; in about one second on the tenth pass the input to the motor jumped from 100 kilowatts to about 750 kilowatts.

This article will serve to give a general idea of the methods used in testing rolling mills. It will be noted that the general scheme of testing either steam or electrically-driven mills is the same, and may be summed up as follows:

(1) To secure a continuous record of the power required to drive the mill.

(2) To secure a continuous record of events taking place in the mill.

(3) To definitely and positively connect records of (1) and (2).

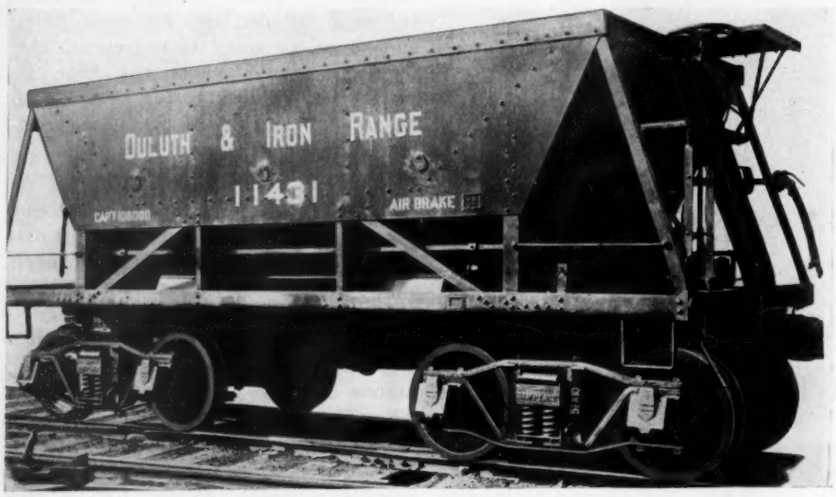
As a final word, it might be well to note that all apparatus and equipment that is used should be as simple and reliable as possible, in order that the tests may run smoothly.

The Clark Ore Car

In the accompanying illustration is shown a new type of ore car of the balanced door dump type, built by the Clark Car Co., Pittsburgh, for the Duluth & Iron Range, Lake Superior & Ishpeming and other railroads engaged in the ore-carrying trade in the Lake Superior district. These ore cars are meeting the requirements for greater capacities and larger openings for the discharge of ore in a unique manner. Not many years ago ore cars were of small capacity with correspondingly small door openings. Even after the 100,000-pound steel car was introduced, a single pair of doors was used to close an opening from 12 to 20 feet square. It was found, however, that these small openings did not permit of the free discharge of the ore even though two or more were used together on a car. On the other hand, when attempts were made to obtain larger areas underneath the load, increased difficulties were encountered, particularly in providing means for promptly and safely opening and closing the doors.

The Clark 100,000-pound ore car is 9 feet, 6 inches high; 8 feet, 6 inches wide and 24 feet long. The floor plates of the hopper, including the valleys, are inclined at an angle of 55 degrees and these sloping plates surround a single opening, 9 feet long and 5 feet wide. This discharge opening is closed by a pair of longitudinal doors which meet on the center line of the car and are inclined at an angle of 30 degrees from the horizontal when in a closed position. Each door is supported on a pair of wheels, which operate on tracks built into the car structure and so curved that the doors move bodily away from the load in the car at the beginning of the opening movement and they continue to move away from the load by rotating on the wheels as the distance from the closed position increases. The simultaneous movements of rolling back from the load and rotating on the wheels permits of the employment of a comparatively flat curve in the door wheel tracks. Therefore, the axes of rotation of the doors move gradually downward and outward until the doors have rotated on these axes sufficiently to free them from the load, at which position the curve in the door track turns upward. The center of gravity of each door is not coincident with its axis of rotation, but is so located as to move practically horizontally as the doors travel between open and closed position. The doors are of heavy construction, weigh 1,600 pounds and are required to support a load of about 40,000 pounds of ore and the opening has an area of 45 square feet.

The doors can be opened and closed by one man and to facilitate this operation the doors are of the balanced type. Provision is made to operate the doors from either side and to lock them directly to each other when closed. The complete operation of opening and closing the doors can be performed by one man in five seconds and the whole time for opening the doors, discharging the load and closing the car has been performed, in a series of competitive tests, in the average time of one minute and 37 seconds. Each load discharged exceeded 100,000 pounds of iron ore. The Lake Superior & Ishpeming Railroad Co. can dump 100 tons of iron ore on its docks at Marquette, Mich., at a cost of 3¼ cents when discharging from Clark balanced door dump cars, whereas the cost of handling the same tonnage in the next best type of steel ore cars is 34½ cents.



CLARK BALANCED DOOR DUMP ORE CAR

At the International Fair recently held at San Antonio, Tex., the Peden Iron & Steel Co., of San Antonio, in conjunction with the Stark Rolling Mill Co., Canton, made a display of sheet metal products which was awarded the first prize. The exhibit consisted of a building constructed entirely from metal products made by the Stark Rolling Mill Co. Included in the display of this building were various styles of metal roofing, siding, shingles, eaves trough, pipe, elbows, etc., made by the Stark company.

Matthew Addy & Co., Cincinnati, in a four-page circular direct attention to manganese by-product for foundry use. This material contains from 10 to 12 per cent manganese, 0.45 to 0.55 per cent silicon, 0.025 to 0.033 per cent sulphur and 0.08 to 0.09 per cent phosphorus.

The H. W. Johns-Manville Co., New York City, announces the removal of its Pittsburgh branch from Liberty avenue, near Ninth street, to Wood street and First avenue. An eight-story building will be occupied. This structure is 31 x 96 feet and contains approximately 23,808 square feet of floor space.

Cost of Operating Motor Trucks

A large number of motor truck manufacturers who have been in business for ten years or more have had so many of their machines in service in different trades and widely separated localities that they have been able to collect a great volume of cost records and from these to calculate averages and tabulate them in an easily available form. Several such makers prepared trade literature containing this information for distribution to interested visitors at their exhibits at the Chicago Automobile Show.

One such company, and a real pioneer in the commercial vehicle field, compiled a table of average costs of operation of its principal sizes of gasoline trucks covering a period of seven years of active service. This table shows that the daily cost of a two-ton truck that averages 70 miles a day is $10.60; that of a three-ton machine averaging 62 miles a day, $12.20; of a four-ton truck averaging 55 miles a day, $13.80, and of a five-ton truck averaging 50 miles a day, $15.

Another long established company compiled a similar cost table covering a period of more than six years. This shows the average daily cost of running a one-ton wagon to be $8.07, of a two-ton truck $10.25, a three-ton truck $11.30, five-ton truck $14.80, seven-ton truck $16.45, and of a ten-ton truck $18.50 a day.

According to the testimony of large business houses it costs from $6 to $6.50 a day to keep a wagon and team of horses at work, but the motor truck does the work of three such outfits, and effects a saving in operation of 33 1-3 per cent. Figured in cost per ton mile, the gasoline motor vehicle shows an efficiency of 175 to 200 per cent as compared with horses.

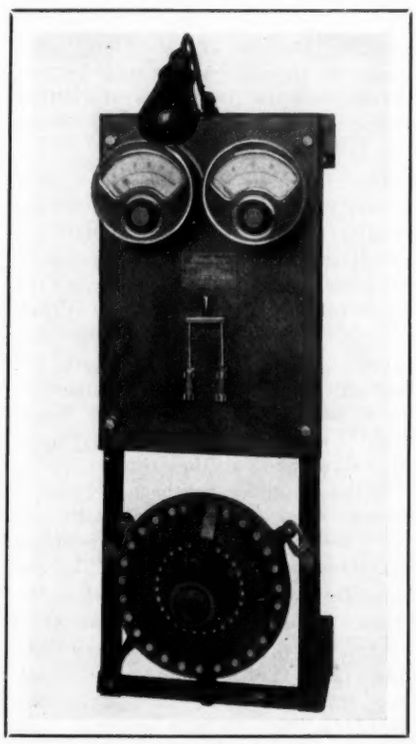


FIG. 1—COMBINATION GENERATOR AND FEEDER WALL PANEL

Switchboads for Small Plants

In small isolated plants and central stations it is exceedingly desirable to keep the initial investment as low as possible and yet to provide good service. To meet the requirements of these plants the General Electric Co., Schenectady, N. Y., has developed a complete line of small switchboards, ranging in capacities from one kilowatt at 125 volts to 200 kilowatts at 250 volts. The panels are made of dull black marine finished slate and are furnished with the necessary copper connection between busses, switches and also circuit breakers, when the latter are supplied, together with the necessary wiring on the back of the board. The instruments have a dull black finish and the current-carrying parts on the front of the panels are polished and lacquered. A complete supporting frame with necessary fittings is furnished with each panel. Small panels for wall mounting are provided with malleable iron supports, while those for installation on the floor are provided with pipe supports. Fig. 1 shows a combination generator and feeder panel and Fig. 2 shows a panel for installation on the floor.

Iron Industry of Sweden

In 1910, there were 81 works in operation in Sweden, engaged in the production of iron and steel. The iron-refining furnaces employed included 209 Lancashire hearths, four charcoal hearth furnaces, 22 Walloon furnaces and six welding furnaces. The steel-making furnaces included 20 Bessemer converters, both acid and basic lined; 62 open-hearth furnaces, nine crucible furnaces, 12 electric furnaces and four cementation furnaces. Of the electric furnaces, six were at Gullspang, four at Kertfors, one at Gysingen, and one at Soderfors. The output of iron from these works in 1910 was 151,713 tons and that of steel 472,249 tons, showing a proportion of 24.6 per cent of the total for iron, as against 27.8 per cent in 1909 and 37.7 per cent in 1901. The accompanying table gives the production of puddled iron blooms and steel ingots, respectively, for the past 17 years.

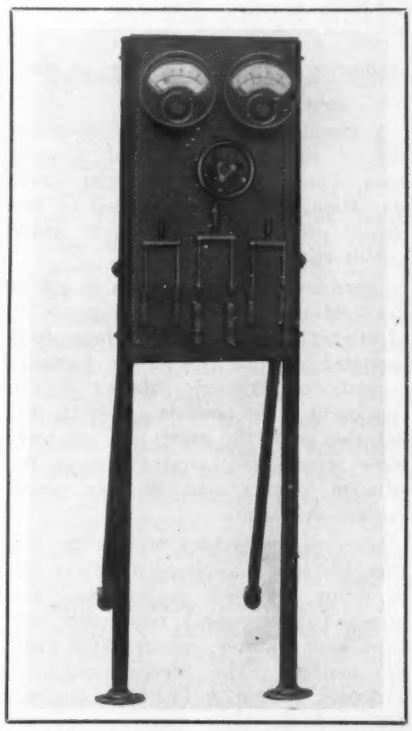


FIG. 2—GENERATOR AND FEEDER PANEL FOR INSTALLATION ON THE FLOOR

The increase in the Bessemer steel output in 1910 over 1901 was only about 20 per cent, or 20,352 tons. Open-hearth steel, on the other hand, showed an increased output of over 95 per cent in that period. The proportion of Bessemer steel to the total was 28.5 per cent in 1901 and 29.4 per cent in 1902, but only 20.6 per cent in 1910. The output of crucible and electric furnace steel in 1910 was 2,215 tons, of which 431 tons were from electric furnaces, 407 tons having been produced at Gysingen and 24 tons at Soderfors.

Swedish Production of Puddled Blooms and Steel Ingots From 1894 to 1910

Year	Puddled iron, blooms, tons	Steel ingots, tons	Total, tons
1894	204,517	167,835	372,352
1895	188,726	197,177	385,903
1896	188,396	257,025	445,421
1897	189,632	274,206	463,838
1898	198,923	263,973	462,896
1899	195,331	272,480	476,811
1900	188,455	299,604	488,059
1901	164,850	269,196	434,046
1902	186,076	286,416	472,492
1903	192,342	318,212	510,554
1904	189,246	332,571	521,817
1905	182,340	368,198	550,538
1906	178,298	397,525	275,823
1907	174,405	420,216	594,621
1908	152,256	437,617	589,873
1909	120,669	313,035	433,704
1910	151,713	472,249	623,962

NEW WORK ON MESABI

Indicates Exploring Policy of the Steel Corporation.

A gigantic project for concreting the bed of the Embarrass river through lakes Wine and Embarrass, near Biwabik, Minn., on the eastern end of the Mesabi iron range is said to be under serious consideration.

There are immense tonnages of ore in this field that are practically impossible of mining at present, as has been demonstrated at great cost at the Syracuse property of Pickands, Mather & Co. Quicksand is the obstacle. It is the belief that with the river bed concreted water would cease seeping through the adjacent country and the ore would become available.

Many engineers have been in the district, and it is understood a definite line of action has been mapped out. The proposed work would cost many millions and probably require three years to complete. The Steel Corporation, Pickands, Mather & Co., the Longyear, Hill and St. Clair interests and the state of Minnesota are all concerned, the latter as the claimant of the ore under all surveyed rivers and lakes.

The Steel Corporation has in progress at the eastern end of the Mesabi, the largest exploratory operation ever instituted in the Lake Superior region. More than 50 drills are employed, many of these manned by the company itself and others by contractors. The operations are being conducted in the territory between Aurora and Mesabi, and chiefly in sections 2, 19, 21 and 30. It is estimated that it will take fully a year to test the country thoroughly.

This work has been started, it is believed, as a result of the decision to relinquish the Hill lease, and is regarded as signifying an intention on the part of the Steel Corporation to proceed with the exploitation of new ore deposits. Important finds have been made in the Eveleth district the past year, not only by the Steel Corporation, but by other interests. In that field, also, the Steel Corporation is opening the Leonidas mine, both as an open pit and an underground property. The company's Fay mine, near Virginia, owned in fee by the state, has been stripped. Drilling by the Steel Corporation has been in progress in the Buhl district.

Do Not Favor Changes.—At the recent meeting in Washington of members of the American Institute of Mining Engineers, who are also members of the United States geological survey, resolutions were adopted opposing the proposed change of the name of the institute to American Institute of Mining and Metallurgy. The resolutions also opposed the proposed change of the classification of members, and stated that in the absence of a financial statement showing that an increased income was necessary, members present were opposed to the proposed increase in dues.

Teaching Metallurgy at Ohio State University

In THE IRON TRADE REVIEW of Dec. 28, page 1132, was published an article by Charles H. Reid, vice president of the Zug Iron & Steel Co., Pittsburgh, in which he made rather severe criticism of universities and technical schools on the ground that they do not give as much attention as they ought to give to instruction concerning the manufacture of puddled iron. "There is not," said Mr. Reid, "a university or technical school whose modern text book gives more than a paragraph or two to wrought iron, or that attempts to give students specific instruction or practical demonstration of how it is made or its value." On this subject, Prof. D. J. Demorest, of the department of metallurgy of the Ohio State University, Columbus, writes as follows:

Mr. Reid's criticisms of the universities is true only to this extent of this university: that the student, in his four-year course, does not have time to be given as much instruction in metallurgy as we would like to give him. However, he gets as much instruction here in the manufacture and properties of wrought iron as he does, for instance, in the Bessemer process, notwithstanding the very much smaller output of wrought iron. The past half-year, a class of 70 students has been meeting five times a week for instruction in the metallurgy of iron, and fully as much time given to wrought iron as to Bessemer steel. I am only sorry we cannot give more time to each division of iron metallurgy.

Besides we also give thorough instruction in the chemical analysis of iron in this department, also in the microscopic examination of iron. We try to ground the students thoroughly in the principles underlying the manufacture of wrought iron in the properties and proper use of various fuels used. We try to keep the instruction as closely in touch with modern practice as possible. I might add that THE IRON TRADE REVIEW is of great help to us in keeping up to date.

The Frederick-Ruggles Mfg. Co., Louisville, which has increased its capital from $6,000 to $20,000, has moved its brass foundry to 107 North Wenzel street, that city. New equipment has recently been added.

GREW SLIGHTLY

Government Statistics on Output of Portland Cement.

Statistics gathered by the United States geological survey from 70 per cent of the Portland cement manufacturers of the country show that the output of Portland cement for 1911 increased only slightly over that of 1910. Estimates based on the incomplete returns place the production at 77,877,236 barrels last year against 76,549,951 barrels in 1910. This represents an increase of 1.7 per cent and the complete returns may show a decrease in production for last year. The increase in production for 1910 over 1909 was 17.7 per cent.

The average factory price per barrel, not including packages, was 86.7 cents in 1911, as compared with 89.1 cents in 1910, a decrease of 2.4 cents or 2.68 per cent.

Figures received by the geological survey indicate decreases in production in the following districts: Lehigh, Kentucky and southern Indiana, and in the great plains and mountain states. The increases recorded were in New York, Ohio and western Pennsylvania, Michigan and northeastern Indiana, Illinois and northwestern Indiana, the southeastern states, Iowa and Missouri, and in the Pacific coast states. Slightly increased prices were received in the Lehigh, New York and Pacific coast districts but in Michigan and northeastern Indiana, Illinois and northwestern Indiana, great plains and mountain states, the averge price was lower than in 1910. In the other districts the price remained at about the same figure.

The survey has changed their grouping of the various districts, the country being now divided into 11 sub-divisions based on the grouping of plants in direct relation to the trade territory covered. It was formerly divided into five geographic groups. The new districts are the Lehigh, including eastern Pennsylvania and New Jersey, New York; Ohio and western Pennsylvania; Michigan and northeastern Indiana; Kentucky and southern Indiana; Illinois and northwestern Indiana; the southeastern states, including Maryland, Virginia, West Virginia, Tennessee, Georgia and Alabama; Iowa and Missouri; the great plains states, including Kansas, Oklahoma and central Texas; the mountain states including Colorado, Utah, Montana, Arizona and western Texas; and the Pacific coast, including California and Washington.

GARY EXPLAINS

Why Papers Used in Prosecution Were Destroyed.

An explanation as to how a trunkfull of papers belonging to the American Steel & Wire Co. was destroyed after the recent examination of these documents by the United States grand jury in connection with the wire pooling cases, is given in a public statement by Chairman E. H. Gary, of the United States Steel Corporation, Wednesday evening, Feb. 7. Judge Gary's statement follows the injunction recently obtained by the government to restrain the Steel Corporation and its subsidiaries from destroying any evidence in the suit for dissolution of the Steel Corporation now pending. Judge Gary says:

I regret that the government has thought it necessary or desirable to file a petition for an injunction to restrain the Steel Corporation and its subsidiary companies from destroying evidence which the government might wish to produce in support of its suit against the Steel Corporation. The petition is based upon the single circumstance that some time in October last. Frank Baackes, vice president of the American Steel & Wire Co., caused to be destroyed certain old papers that had been before the federal grand jury in New York when they were investigating the so-called Jackson wire pools. I had never heard of the destruction of these papers until yesterday, and upon inquiry I learn that the circumstances were as follows:

In the spring of 1911, the New York federal grand jury, under the direction of District Attorney Wise, began an investigation into the Jackson wire pools. During the course of this investigation, a subpoena was issued directing the Wire company to produce all papers and letters bearing upon the transactions under inquiry. The officers of the Wire company complied with this subpoena by gathering together from their files all the papers called for. They were very numerous and filled a large trunk. One of the officers brought the trunk full of papers from Worcester, Mass., where they were assembled, to the grand jury room in New York. Instead of being retained, in accordance with the usual custom, in the custody of the officer producing them during the recess of the grand jury, these papers were turned over to the district attorney at his request, in order that he and his assistants might have opportunity to examine them. As I am informed, this examination was made and the papers were catalogued and their contents noted. Upon the examination being completed, and upon the day the indictments were filed, the trunk full of papers was returned to Mr. MacVeagh in response to his letter, referred to in the petition.

The indictments were all disposed of *nolo contendere* and the papers were never called for again by the district attorney. The trunk remained in the personal charge of Mr. MacVeagh during all of July and until the 25th of August, when he left on a two months' vacation. During the absence of Mr. MacVeagh, Mr. Bolling, assistant general solicitor, was in charge of the office. He had been absent in Europe during the month of July and part of August. At the end of September, the offices of Mr. MacVeagh and Mr. Bolling were moved from the seventeenth to the sixteenth floor of No. 71 Broadway. Mr. Bolling then noticed the trunk in one of the offices and directed that inquiry be made at the offices of the American Steel & Wire Co., No. 30 Church street, New York City, to ascertain if the trunk could not be stored there. Upon hearing that it could, he directed its removal, and it was accordingly removed to the offices of the Wire company on or about Sept. 28, 1911. This was done without the knowledge of Mr. MacVeagh. When Mr. Colton, of the department of justice, applied about the end of January for leave to inspect the contents of the trunk, Mr. Bolling made inquiry at the office of the Wire company in New York, and learned that shortly after the trunk was received at that office it was forwarded by direction of Mr. Baackes, to the office of the Wire company at Worcester, Mass., from which it had originally been sent. Further inquiry developed that after its arrival at Worcester its contents were destroyed by order of Mr. Baackes. Mr. Baackes reports that when he ordered the contents destroyed he supposed that all the prosecutions growing out of the wire pools were at an end and that the papers were no longer needed for any purpose.

Mining Stopped by Injunction

Work on the Hull-Rust and Burt-Sellers mines of the Oliver Iron Mining Co., at Hibbing, Minn., was stopped last week following the issuance of an injunction to prevent operations in one section of the Burt-Sellers mine. The injunction was secured by a woman who claimed that the blasting has affected her nerves and that the company was gradually drawing closer to her property. Seven hundred men were thrown out of employment, the company stating that the mine was closed down until the officers had investigated the scope of the injunction. Certain political interests are said to be back of the injunction, claiming that the company was gradually drawing closer to the town and the value of property was depreciating. To offset this, others point out that to benefit the workers the company keeps a large force of men employed during the winter months at work that could be done at other seasons at less expense.

The Chicago Metal Wheel Co., Chicago, has filed notice of its dissolution.

TARIFF BILL HEARINGS

Commence at Washington—Testimony of First Two Days.

The first of the hearings by the senate finance committee on the proposed Underwood metal tariff schedule revisions was held at Washington, on Feb. 7, the first testimony being submitted by Henry C. Atkins, of E. C. Atkins & Co., Indianapolis, manufacturers of saws. Mr. Atkins asserted that the house bill rate on circular and cross-cut saws would result in a material loss to manufacturers, as the tariff rate under the present law, about a third higher, only barely covers the differences in cost of production between this and European countries.

J. E. Fredericks, Kokomo, Ind., a manufacturer of wire and wire products, including nails and barbed wire, complained that under the house bill all of his products are on the free list, while his raw material is dutiable. His contention was that if he were to be compelled to meet universal competition, he should be permitted to get his material without the restriction of a duty.

William Piggott, Seattle, representing the Pacific Coast Steel Co., declared the bar iron and steel manufacturers of the Pacific coast would be compelled to close their mills if the house bill rates go into effect.

Charles M. Schwab, president of the Bethlehem Steel Co., who appeared before the committee on Feb. 8, was emphatic in his declarations that the proposed tariff reductions would prove a very serious blow to the steel business, in eastern as well as western states. He stated that the labor account is the chief factor in the difference between cost of production here and abroad, and that the present tariff rates were necessary to the prosperity of the steel business. Mr. Schwab added:

"After all my work and the investment of my fortune, I have never taken a penny out of the industry and have never paid any dividends, and if the proposed tariff is to be a law, I repeat that I shall cash in."

Small Contracts Placed.—The International Portland Cement Co. has placed an order with the Central States Bridge Co. for 200 tons of fabricated material for improvements to its plant in the state of Washington. The Belmont Iron Works has the 300 tons recently awarded for the Pennsylvania railroad station at Newark, N. J.

SURPRISINGLY LARGE

Is Value of Our Machinery, Cutlery and Hardware Exports.

So much attention has been directed of late to the tonnage iron and steel export business, as conducted chiefly by the United States Steel Corporation, that emphasis should be laid upon the fact that the exports

IRON AND STEEL IMPORTS, GROSS TONS.

1902	1,206,811
1903	1,178,996
1904	266,398
1905	416,000
1906	577,809
1907	662,349
1908	205,845
1909	363,984
1910	487,972
1911	256,903

of non-tonnage lines, covering machinery, hardware, cutlery, etc., are very large. In the five years 1906 to 1910 inclusive the value of the non-tonnage iron and steel exports exceeded the value of the tonnage iron

IMPORTS BY MONTHS.

	1910.	1911.
January	56,207	32,795
February	43,613	20,455
March	54,176	23,533
April	47,698	22,392
May	42,569	23,376
June	30,322	29,395
July	41,933	15,782
August	36,879	19,943
September	30,961	14,039
October	31,455	21,035
November	40,585	13,878
December	31,575	19,665
Totals	487,973	256,903

and steel exports by from 111 to 118 per cent, being on an average 131 per cent in excess, so that the tonnage exports constituted only about 30 per cent of the total value of iron and steel exports, tonnage and non-ton-

IRON AND STEEL EXPORTS, CALENDAR YEARS.

	Tonnage lines, gross tons.	Value of tonnage lines.	Value of non-tonnage lines.	Total value.
1902	372,398	20,996,450	76,895,586	97,892,036
1903	326,590	20,452,839	78,583,026	99,035,865
1904	1,167,710	42,551,109	86,002,504	128,553,613
1905	1,010,255	42,104,348	100,824,165	142,928,513
1906	1,325,740	52,215,089	120,340,499	172,555,588
1907	1,301,979	60,046,221	137,020,560	197,066,781
1908	964,242	43,397,323	107,715,791	151,113,114
1909	1,243,462	50,783,138	106,897,193	157,680,331
1910	1,537,943	63,276,714	137,995,189	201,271,903
1911	2,187,809	86,601,670	163,054,741	249,656,411

nage. In 1911, however, the 42 per cent increase in the weight of the tonnage lines was accompanied by a 36 per cent increase in their value, while the non-tonnage lines increased only 18 per cent in value, the result being that the value of the non-tonnage lines exceeded the value of the tonnage lines by only 89 per cent,

IRON AND STEEL EXPORTS, GROSS TONS.

	December, 1910.	December, 1911.	Twelve months ending December, 1910.	Twelve months ending December, 1911.
Scrap	4,716	3,989	25,825	77,918
Pig iron	11,419	10,941	127,385	120,799
Billets, sheet bars, etc.	10,880	17,435	58,230	234,267
Wire rods	1,572	3,925	22,869	22,641
Rails	41,593	22,874	353,180	420,874
Steel bars	8,237	11,397	107,561	123,349
Iron bars	1,116	1,015	18,045	17,683
Structural	13,318	17,728	146,721	223,493
Hoop, band and scroll	*	799	*	*3,731
Sh'ts and plates	23,041	43,861	274,521	372,372
Tin plates	1,043	6,736	12,445	61,466
Barb wire	6,556	8,013	79,461	96,754
All oth. wire	7,342	14,520	92,467	133,008
Cut nails	496	947	8,129	11,422
Wire nails	4,260	9,048	42,870	53,614
All other, including tacks	765	716	10,202	12,848
Pipes & fit'ngs	13,298	17,502	155,778	197,507
Cast radiators, etc.	450	385	2,254†	4,063
Totals	150,102	190,938	1,537,943	2,187,809

*Not separately stated prior to July 1, 1911.
†Not separately stated prior to July 1, 1910.

the tonnage lines constituting 35 per cent of the total value of iron and steel exports. In the accompanying table the complete figures are given for a period of ten years, showing the total weight of the tonnage lines reported, their declared value, the value of the non-tonnage lines, which as noted include machinery, hard-

IRON ORE IMPORTS FOR THREE YEARS.

	1909.	1910.	1911.
Spain	291,547	439,868	194,965
Sweden	129,564	259,911	219,238
Canada	27,155	89,305	50,480
Newfoundland	224,395	214,706	174,853
Cuba	927,774	1,451,096	1,147,879
Other countries	103,522	136,145	24,317
Totals	1,694,957	2,591,031	1,811,732

ware, cutlery, etc. (but not agricultural implements) and the total of these two items, tonnage and non-tonnage.

Iron and steel imports in December were larger than in November, but fell slightly below the average of the preceding 11 months. The total imports in 1911 were 51.5 per cent smaller than those of 1910. The following table shows our total iron and

IRON ORE IMPORTS, BY MONTHS.

	1909.	1910.	1911.
January	105,233	284,823	102,600
February	61,749	170,427	94,820
March	108,676	163,633	134,785
April	74,782	206,135	133,900
May	97,393	240,833	217,467
June	124,714	193,415	118,296
July	172,316	248,810	200,845
August	209,855	282,949	175,183
September	164,613	208,892	184,456
October	178,051	219,571	172,459
November	174,966	197,833	128,019
December	222,609	173,710	148,902
Totals	1,694,957	2,591,031	1,811,732

steel imports during the past ten years. When the imports were large, the excess was generally attributable

IRON AND STEEL IMPORTS, GROSS TONS.

	December, 1910.	December, 1911.	Twelve months, ending December, 1910.	Twelve months, ending December, 1911.
Scrap	2,621	650	72,764	17,272
Pig iron	19,911	13,795	237,233	148,459
Blooms, billets and steel n. e. s.	1,794	1,099	46,578	29,205
Wire rods	1,450	1,146	20,374	15,483
Rails	*	335	*	*1,606
Bar iron	2,504	1,607	38,231	26,729
Structural	*	245	*	*1,597
Sheets and plates	180	378	6,152	2,453
Tin plates	3,110	410	66,640	14,099
Totals	31,575	19,665	487,972	256,903

*Not separately stated prior to July 1, 1911.

to pig iron, but in 1902 and 1903 unfinished steel was also imported in rather large tonnages.

American Institute of Mining Engineers

The American Institute of Mining Engineers will hold its mid-winter meeting in the United Engineering building, New York City, on Feb. 19, 20 and 21. This meeting was formerly only a business meeting. It is the intention this year to enlarge its scope by the reading and discussion of papers, and also to the promoting of social intercourse among the members. On the evening of Feb. 19 there will be a general reception in the institute rooms. On Feb. 20 there will be morning and afternoon sessions and also on Feb. 21. On the evening of Feb. 20 there will be a dinner at the Plaza hotel to members and their guests.

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

	1907.	1908.	1909.	1910.	1911.
January	$ 14,327,926	$ 13,468,058	$ 10,329,388	$ 14,513,394	$ 18,739,961
February	13,946,842	14,063,559	10,947,159	13,949,082	18,690,792
March	16,419,116	15,168,155	13,874,461	17,258,503	22,591,848
April	17,684,863	15,455,319	13,058,054	16,529,254	24,917,056
May	14,594,043	11,281,415	12,993,197	17,658,042	20,616,795
June	17,226,259	11,677,944	13,779,736	16,503,204	20,310,053
July	17,614,017	12,085,951	11,866,772	16,108,102	18,052,337
August	17,587,181	12,058,561	14,136,219	17,628,538	20,704,154
September	16,830,160	11,221,799	12,966,908	16,776,178	20,534,139
October	18,786,750	11,505,063	14,249,598	17,452,085	20,799,591
November	17,051,755	10,895,549	14,434,690	18,593,806	21,547,399
December	14,997,869	12,231,741	15,075,183	18,300,710	22,186,996
Totals	$197,060,781	$151,113,114	$147,680,331	$201,271,903	$249,656,411

EXPORTS OF TONNAGE LINES—GROSS TONS.

	1907.	1908.	1909.	1910.	1911.
January	102,630	74,353	70,089	118,652	152,360
February	87,912	81,773	84,860	110,224	150,919
March	112,787	96,681	94,522	124,980	215,888
April	132,790	93,285	100,904	117,921	228,114
May	91,543	64,041	109,977	135,306	178,428
June	92,996	69,770	114,724	120,601	174,248
July	122,240	86,796	100,680	128,216	162,929
August	118,792	86,244	105,694	131,391	177,930
September	114,819	76,732	97,392	119,155	181,086
October	123,170	85,766	110,821	129,828	186,234
November	116,309	71,130	115,943	155,138	187,541
December	86,019	77,659	137,688	150,102	190,938
Totals	1,301,979	964,242	1,243,467	1,537,943	2,187,809

Iron and Steel Securities

Outside influences which might be regarded as having any bearing on the market last week were almost entirely disregarded by the New York stock exchange and trading was dull throughout the period with prices moving to a fractionally higher level.

Monday, inactive trading was attended by a decline on the part of several inactive stocks, but the list in general was not noticeably affected; foreign markets were all depressed. Tuesday, the market showed more activity, prices showing strength in the early trading but declining later. Wednesday, the list lapsed into extreme dullness and was very irregular, but closed with small net changes. Thursday, the market was again dull and irregular with small net price changes; $2,250,000 worth of gold was engaged for shipment abroad and $1,000,000 in currency was shipped to San Francisco. Friday, dull trading was attended by insignificant price changes; cotton advanced; foreign markets were dull and irregular. Saturday, the market was weak under the leadership of Steel common, which went to 59 and closed at the lowest.

Money on call ranged between 2½ and 2 per cent. Time money was offered liberally at easy rates, but borrowers did not take advantage of this to any great extent. The actual condition of clearing house institutions showed loans increased $10,329,000; net deposits decreased $5,588,000; total reserve, $471,087,000, and the excess of reserve, $37,616,850, a decrease of $3,159,000. Non-member banks and trust companies showed loans increased $7,125,300; net deposits increased $6,957,100; reserve on deposits increased $1,144,000, and the percentage of reserve 20.1, against 19.9 the preceding week. Fortnightly railroad statistics showed a decrease in the idle car surplus of 57,704. Bank clearings showed a decrease from the preceding week, but an increase over the corresponding week a year ago. Commercial failures numbered 348, compared with 368 the preceding week and 276 the corresponding week last year. Shares were sold to the number of 1,906,960, compared with 3,630,593 the preceding week and 2,521,800 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $15,613,000, compared with $17,961,000 the preceding week, and $15,346,000 the corresponding week last year.

	Clos'g Quo. Feb. 10	Changes in week.	Annual Meeting date 1912	Stock Outstanding	Basis.	Dividend Last Dividend	Date Last Div. Pay
Allis-Chalmers	1	.....		$19,820,000		.....	
Allis-Chalmers, pr	7	— ⅞		16,050,000	7 cum.	1¾ Q.	Feb. 1904
American Can	11⅝	+ ⅛	Feb. 6	41,233,300		.....	
American Can, pr	91⅞	+ ¾		41,233,300	7 cum.	1¼ Q.	Jan., 1912
Am. Car & Fdy	51	+ ¼	June 27	30,000,000	2	½ Q.	Jan., 1912
Am. Car & Fdy., pr	115¼	— ½		30,000,000	7 n. c.	1¾ Q.	Jan., 1912
American Loc	33¼	— ¼	Oct. 15	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	104	+1		25,000,000	7 cum.	1¾ Q.	Jan., 1912
American Ship	50	.....	Oct. 9	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	101⅞	—1⅛		7,900,000	7 n. c.	1¾ Q.	Jan., 1912
Am. Steel Foundries	28½	— ½	Mar. 21	17,184,000	5	1¼ Q.	May, 1911
Barney & Smith	10	.....	June 4	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	80	.....		2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	31½	— ⅜	April 2	14,862,000		.....	
Bethlehem Steel, pr	59⅜	—1⅜		14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43	+ ¼	Mar. 19	45,000,000*	5	1½ Q.	Feb., 1912
Cambria Iron	45	+ ¼		8,468,000*	4	2 S. A.	Oct., 1911
Chicago Pneumatic Tool	47	—1¾	Feb. 19	6,448,800	4	1 Q.	Jan., 1912
Colorado Fuel	25⅝	— ⅜	Oct. 21	34,235,500		1¼ Q.	April, 1902
Crucible Steel	11⅜	— ⅜	Nov. 15	24,578,400		.....	
Crucible Steel, pr	82	+ ½		25,000,000	7 cum.	1¾ Q.	Dec., 1911
Empire Steel	10	.....	Feb. 28	1,254,770		.....	
Empire Steel, pr	36	.....		2,500,000	6 cum.	2 S. A.	July, 1911
Fay & Egan	70	.....	Feb. 20	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan, pr	110	.....		1,000,000	7 cum.	1¾ Q.	Nov., 1911
General Electric	156¾	— ¼	May 14	77,281,200	8	2 Q.	Jan., 1912
Harbison-Walker	40	.....	Jan. 15	18,000,000	2	½ Q.	Dec., 1911
Harbison-Walker, pr	100	.....		9,600,000	6 cum.	1½ Q.	Jan., 1912
International Pump	30	.....	Dec. 10	17,762,500		½ Q.	Apr., 1905
International Pump, pr	79	.....		11,350,000	6 cum.	1½ Q.	Feb., 1912
Lackawanna Steel	30½	+ ½	Mar. 13	34,978,000		.....	
Lake Sup. Corp	28	.....	Oct. 2	40,000,000		.....	
New York Air Brake	54⅞	.....	Mar. 13	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	95	.....	Feb. 7	8,500,000	6	1½ Q.	Mar., 1912
Niles-Bement-Pond, pr	104	.....		2,000,000	6 cum.	1½ Q.	Feb., 1912
Otis Elevator Co	70	.....	Mar. 18	6,358,600	4	1 Q.	Jan., 1912
Otis Elevator Co., pr	130	— ½		6,375,300	6 n. c.	1½ Q.	Jan., 1912
Pa. Steel	60	.....	May 13	10,750,000		.....	
Pa. Steel, pr	100½	+ ½		20,587,500	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	17⅜	— ⅝	Mar. 12	28,104,600		.....	
Pittsburgh Coal, pr	79	—1	Oct. 7	27,071,830	7 cum.	1¼ Q.	Jan., 1912
Pittsburgh Steel Co., pr	103	.....	Feb. 21	7,000,000	7 cum.	1¾ Q.	Mar., 1912
Pressed Steel Car	32½	+2½		12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	103½	.....	Nov. 13	12,500,000	7 n. c.	1¾ Q.	Feb., 1912
Pullman	159½	+1	Mar. 7	120,000,000	8	2 Q.	Feb., 1912
Railway Stl. Spring	27½	—1½		13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	100½	.....	Oct. 16	13,500,000	7 cum.	1¾ Q.	Dec., 1911
Rep. Iron & Steel	20¾	—2⅛		27,191,000		.....	
Rep. Iron & Steel, pr	75	—4½	Mar. 13	25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	40	+ ¾		10,000,000	5	1¾ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....	June 26	6,700,000	7 n. c.	1¾ Q.	Jan., 1912
U. S. Pipe & Fdy. Co	16	.....		12,500,000		1 Q.	Dec., 1907
U. S. Pipe & Fdy. Co., pr	50⅛	.....	April 15	12,500,000		1¼ Q.	June, 1911
U. S. Steel	59	—1¼		508,302,500	5	1¼ Q.	Mar., 1912
U. S. Steel, pr	107⅝	—2⅜		360,281,100	7 cum.	1¾ Q.	Feb., 1912
U. S. Steel 5s	103	— ⅜	Sept. 17	465,189,500	5	.....	
Va. Iron, Coal & Coke	67¾	.....	Oct. 1	9,073,680		5. †	Oct., 1907
Westinghouse Air Brake	157¾	— ¼	June 12	14,000,000*		5 Q.‡	Jan., 1912
Westinghouse Electric	70½	+ ⅜		3,998,700*	7 cum.	1¾ Q.	Jan., 1912

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Include 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York. — Amalgamated Copper closed 62, a net gain of 1¼.

Boston. — Butte Coalition closed 22¾, a net gain of ⅞; Calumet & Arizona closed 59½, a net gain of 1; Calumet & Hecla closed 410, no change; North Butte Mining closed 26¼, a net gain of 1¼; Quincy Mining closed 76, a net gain of 2.

Financial Notes.

The Wheeling Steel & Iron Co. recently declared a dividend of 2 per cent, payable Feb. 9.

The Pratt & Whitney Co. has declared the regular quarterly dividend of 1½ per cent, payable Feb. 15.

Directors of the Pittsburgh Steel Co. have declared a cash quarterly dividend of 1¾ per cent on preferred stock, payable March 1.

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An Undiscussed Phase of the Tariff Question

There is a phase of the tariff question as applied to iron and steel which is not usually discussed, but which is very important and indicates the need for protection beyond that which would be accorded by following simply the "difference in labor cost" rule lately formulated.

Doubtless one reason why the phase we refer to has not been generally discussed is that it might be thought at first glance to suggest that American manufacturers are not as up to date as they might be, but this is by no means a reasonable conclusion, as we hope to show. The phase we refer to is that the American iron and steel industry requires a measure of tariff protection by reason of the fact that a number of improvements in methods and appliances have been made abroad, but have not secured general adoption as yet in the United States. Merely in order to suggest the field we refer to, reference may be made to the rectangular combustion coke oven, the by-product coke processes, blast furnace gas engines, the thin-wall blast furnace, electric mill drives and the manufacture of various steel alloys.

It is true that there is not one of these improvements mentioned, or many others that could be cited, which has not already met a measure of adoption in this country. We have them, but rather as samples than as general practice. Abroad they are more generally used that here. It may not be generally known that the appliances or processes to which reference is made are much more general abroad than they are in the United States, but such is the case. The limited adoption in this country does not help the industry as a whole, for the competition first touches the least economical plants. For example, were the steel industry of the United States made up of 10 steel plants, one able to make billets at $16 a ton, another at $17, another at $18, and so on up to $25, it would not be sufficient that the best five could meet the competition of foreign steel offered at $20.50. Foreign steel offered as high as $24.50 would put one of the plants out of business.

It is a fact that various improvements in processes and devices which have been quite generally adopted abroad and have thus far met with but relatively limited adoption in the United States operate to the disadvantage of the United States and require that a portion of the protective tariff should be arranged to cover the difference, quite apart from the portion which should be arranged to cover the difference in labor cost on account of the much higher standard of wages prevailing in this country.

That there has been more general adoption of certain improvements abroad than has been the case in the United States is no discredit to our industry. It is not because Americans are slow, for upon occasion they have shown that they are not. It is chiefly because the industry has had to grow so rapidly, on account of our rapidly increasing demand. That American steel makers are not slow is shown by the fact that when they were, perforce, replacing the manufacture of wrought iron with the manufacture of steel, they easily led the world in the completeness and economy of the appliances and processes adopted. Both England and Germany then looked to the United States. So much for the natural tendency of our industry to be in the lead.

It has not been possible for the entire American capacity to be maintained at the very front, to have all its appliances and methods the very best that can be found anywhere, for the reason that demand has grown with extreme rapidity, necessitating new erection at top speed, leaving little time for experimenting, and creating an enormous demand for capital.

The American iron and steel industry has had to grow chiefly out of its own earnings. It is sometimes remarked that no large fortunes have ever been taken out of the industry, except by selling out. Of course not! In order to stay in the race at all, a concern has had continually to reinvest its profits. Should it sell out, the price would be high, but if it did not sell out, it could not disburse fortunes in dividends.

The immense amount of new construction which has been necessary may be shown by a very few figures. We select three years, 1892, a year of sustained activity and fair prosperity, the year before the general industrial depression, 1899, a "boom" year, and 1906, a year of full activity. These years mark intervals of seven years. Production of steel ingots and castings in 1892 was 4,927,581 gross tons; in 1899, 10,639,857 tons, and in 1906, 23,398,136 tons.

In the seven years, 1892 to 1899, the increase in tonnage was 116 per cent, and in the seven years, from 1899 to 1906, it was 120 per cent. Over the entire 14 years, the increase was 375 per cent, so that production was multiplied almost by five.

It was necessary for the American iron and steel industry to supply a tremendous amount of capital in order to create the additional capacity required to supply the demand. While furnishing this capital, it was difficult, if not impossible, to supply as much capital as might otherwise have been furnished for making experiments along new lines or for reducing costs of production without increasing capacity.

In England and Germany, there have been no such tremendous increases in demand. Production of steel ingots in England in 1892 was 3,019,640 gross tons, increasing to 4,955,325 tons in 1899, or 64 per cent, and then to 6,575,000 tons in 1906, or 32 per cent, making a total gain for the 14 years of 127 per cent.

There are no German statistics of steel ingot production for the early years, and pig iron production must be taken. This was 4,937,461 metric tons in 1892, increasing to 8,143,133 tons in 1899, or 65 per cent, and then to 12,292,819 tons in 1906, or 51 per

cent, making 149 per cent increase in the whole 14 years.

Thus in the 14 years we have 375 per cent increase in the United States, 127 per cent in England and 149 per cent in Germany. These two foreign countries, therefore, have been able to put more of their available capital into improvements, having less occasion to put it in new capacity. It is a clear business proposition that the foreign producers have had a better opportunity to make improvements reducing the cost of production than have the American producers.

The benefit of allowing manufacturers to obtain fair profits was well illustrated by the American tin plate industry. On account of the large duty, 2.2 cents per pound, imposed by the McKinley law, very comfortable profits were assured, and the pioneers made good profits, which they invested in improvements with the result that the cost of production was rapidly reduced, and the Welsh manufacturers, who thought they knew everything that could be known about the business, began to adopt methods which the American pioneers, with their comfortable profits, had been able to adopt. The result was the production of tin plate at much less expenditure of material and effort, irrespective of wage rates paid, than was possible at the start.

Opposed to "Stump Legislation"

The agitation in favor of the initiative and the referendum, which has been sweeping over this country and threatening to carry everything before it, was given a severe jolt a few days ago by Governor Harmon in an address delivered before the constitutional convention of Ohio, who opposed making the "stump the seat of legislation". At the last election, delegates to this convention were elected, and the result was an overwhelming victory for the advocates of the initiative and referendum. It required, therefore, a high order of courage for a man to stand before this convention which he knew to be antagonistic to his ideas and tell the delegates that he was convinced that the application of the initiative and referendum had gone far enough in the state of Ohio. The governor said that if the change would work well anywhere, it ought to do so in our municipalities. Hence, he approved a bill passed at the last session of the legislature to authorize it in the cities of the state. Very little, if any, attempt had been made to test the new law and the governor said that he was firmly of the opinion that before making state-wide the operation of so radical a change in methods, the people of Ohio ought to await the result of a fair trial of the new law. Governor Harmon spoke in part as follows:

"I always keep an open mind for all proposals to make our government more efficient, economical and responsive to public needs. And I believe that within the safeguards of personal rights and other limitations they themselves impose by a constitution, prepared and adopted with deliberate care, the people's will is the supreme law which it should be made as easy as possible to declare and enforce.

"But I am not convinced that the initiative and referendum, applied generally to subjects of legislation, would be an improvement on our system of government by representatives, which, while it has shortcomings like all human institutions, I do not believe has proved a failure.

"A somewhat wide experience, as well as observation, has taught me that government, in all its branches, is a complicated and difficult business which requires careful study and close attention, besides the consideration of many things in the doing of each one. And my doubt is whether these essentials can or would be supplied by a large, busy and widely separated body of electors acting directly in matters of general legislation.

"I believe the work of legislation can be properly done only by bodies small enough for each member to get the advantage of conference, debate and deliberation, with the concurrence of both required and absolute rules to prevent hasty action by either, as well as final approval by another and independent actor in the proceedings.

"Of course, if these agencies all prove incapable or corrupt, if for any reason they betray the confidence reposed in them by the people and fall under the control of special interests which seek advantages contrary to common right and injurious to the public, then the plan will miscarry. And this seems to have happened with alarming frequency in some of the states. But whatever the case may be or may have been elsewhere, Ohio has furnished no such example, even before the executive was given a voice in the making of her laws. I do not mean that we have had no bad legislation and no unworthy representatives; but these have been too rare to discredit the magnificent history of more than a hundred years. Our citizens have never enforced higher standards in the public service than they are doing now. So some other reason must be found to justify a change in our system which would throw off the checks and precautions against hasty and unwise legislation, which have been so carefully provided, and make the stump the seat of legislation.

"However, I believe that, in actual practice, this change would not fully justify either the fears of its opponents or the hopes of its advocates. If it will work well anywhere, it ought to do so in our municipalities. So, to add to discussion of it, the argument of a test by our own citizens, I approved a bill at the last session to authorize it in them, though, I am told, it has not yet been resorted to anywhere."

The governor's speech caused a tremendous sensation in the state, and, in the opinion of many, it has ruined his presidential chances. Perhaps it has, but whether that be the result or not, the ultimate effect of the governor's address will do a great good in causing thoughtful people to pause before rushing into the adoption of untried and perhaps dangerous policies.

Another effective blow at "stump legislation" was delivered by President Taft in a speech delivered in New York, Monday evening, when he said:

"With the effort to make the selection of candidates, the enactment of legislation and the decision of courts to depend on the momentary passions of a people necessarily indifferently informed as to the issues presented, and without the opportunity to them for time and study and that deliberation that gives security and common sense to the government of the people, such extremists would hurry us into a condition which could find no parallel except in the French revolution or in that bubbling anarchy that once characterized the South American republics."

CAMBRIA'S REPORT

For Year 1911 Shows Strenuous Character of Market.

The report of the Cambria Steel Co. for the fiscal year ending Dec. 31 last, contains the following comparative income account:

	1911.	1910.
Earnings	$3,618,334	$5,461,335
Less extra. replace....	369,588	514,529
Net earnings	$3,248,746	$4,946,806
Fixed charges	471,407	393,474
Income	$2,777,339	$4,553,332
Inventory deprec.....	.....	.....
Net income	$2,777,339	$4,553,332
Dividends	2,250,000	2,250,000
Surplus net income.....	$ 527,339	$2,303,332
General deprec.....	150,000	100,000
Betterments and imprv..	.....	2,090,039
Profit and loss.....	$ 377,339	$ 113,293
Profit and loss end year.	2,784,104	2,414,090

The report, which is signed by Effingham B. Morris, chairman, and Charles S. Price, president, says:

The expenditures for improvements during the year were confined mainly to the amounts necessary for the completion of those begun during the previous year. There were, however, a number of comparatively small amounts chargeable to improvement account and covering new equipment necessary to meet current operating demands with the greatest economy. The sums expended in ordinary repairs and maintenance and in replacement and reconstruction, while less than last year, in part due to decreased tonnage, does not indicate any falling off in the physical condition of your plant, which has been maintained at a high standard of efficiency.

The year has been one of the most trying in the history of the steel trade,—differing from the usual trade depression in that there was no apprehension of underlying financial conditions, yet a distinct cloud of doubt and uncertainty so dominated business that consumers' stocks were reduced to the minimum and buying confined to the immediate necessities of the purchaser. Orders were contingent upon delivery and larger and more diversified stocks had to be carried to meet the demands and warehouse competition.

Your board found it advisable on May 1, 1911, to negotiate $2,000,000 5 per cent three year gold coupon notes to provide for current needs. As your additions to plant for the year amounted to $1,430,855.79, the funds provided by this loan were largely absorbed in the improvement account, and the balance in working capital necessitated by the expansion of your business.

The first of the year found the car shop without orders, and after completing a thousand cars from an order of the previous year, the plant was idle until practically Nov. 1, when sufficient orders were obtained to start on about two-thirds capacity. The volume of business was somewhat better at the close of the year, as indicated by an actual tonnage of specifications on your books on Dec. 31, 1911, of 189,077 gross tons, in comparison with 42,923 gross tons on Dec. 31, 1910.

The curtailment in demand for your products which existed during the latter part of the year 1910 continued during the entire year just ended. Lower prices than those prevailing in 1910 were increasingly in evidence in many products from the first of the year, until in June, under the stress of acute competition, the market became practically demoralized. In no class of your products was the curtailment in demand more marked than in the purchases by the railroads. In 1910 such purchases were 43.7 per cent, while in 1911 but 25 per cent of your total shipments.

The report then points out the output and repairs that have been accomplished by the various plants during the year as follows:

The Johnstown mines produced during the year 1,313,073 gross tons of coal. There were used at the works 394,251 gross tons of limestone, operations at the Mifflin county quarry being closed and concentrated at the Blair county quarry, the former having a higher freight rate. A 6,000 kilowatt turbine driven generator will be installed by April at the Cambria works; an experimental briquetting ore plant is being installed at the 1 to 4 blast furnaces; reconstruction of the blooming mill conveyor has been completed. At the Gautier works the 8 and 12-inch semi-continuous electrically driven bar mills were completed during the year, the 8-inch not being started until August, and the 12-inch until October; the 13 and 22-inch mills were thoroughly overhauled. At the Franklin works No. 2 ore bridge and the open-hearth charging machines were rebuilt, as was also portions of the 40-inch blooming mill; the axle finishing shop was rearranged and new lathes and boring mills installed; considerable new construction was done at the coke plant. Further progress was made on dam construction, etc., by the Manufacturers' Water Co. and the Johnstown Water Co., both subsidiaries of the Cambria company.

Concerning the new rod and wire plant, the report says:

Work on the rod and wire mill was pushed actively from the beginning of the year until the practical completion of all the departments, and the rod mill turned out the first rods Feb. 15, 1911. The several departments—wire drawing, nails galvanized wire and barbed wire—became operative at successive periods between April 15 and Dec. 31. This completed all departments originally proposed for the plant with the exception of the poultry netting and wire fence departments, the first of which will be operative by February, 1912, and work on the latter is progressing. The starting of the several departments of this plant was successfully accomplished, but owing to the handicap of building up an organization, the limited portion of the year in operation, a severe curtailment in the market demands and with low selling prices due to keen competition, the results, while on a remunerative basis for the closing months, were not sufficient to offset the starting expense, and have consequently contributed nothing to the year's net income.

Meeting of Philadelphia Foundrymen

The 215th meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club, Feb. 7. Thomas Devlin presided. About 100 members were present.

Thomas Liggett Jr., of the United States Sherardizing Co., New Castle, Pa., read a paper on sherardizing, which was illustrated by lantern slides. The talk included the discovery of the process, the structure of the coating, and its resistance as compared with the electric and hot galvanizing process. A general discussion followed.

The second part of the program was an address by D. S. Paterson, manager of the Double Service Packing Co., on the subject of flax fiber and its use in the packing art. A demonstration of the value of the material was given.

Duplicate photographs of those who attended the twentieth anniversary banquet were distributed.

New York Offices of Brier Hill Steel Co.

The New York offices of the Brier Hill Steel Co., Youngstown, O., which is a merger of the Empire Iron & Steel Co. and the Thomas Steel Co., of Niles, O., together with the Brier Hill Iron & Coal Co., and the Youngstown Steel Co., of Youngstown, will be at 345 Fifth avenue. W. C. Dickey, who for several years has been associated with the Empire Iron & Steel Co., at the same address, will be the New York representative in charge of this branch.

The Star Furnace Co., Jackson, O., has let all contracts for the rebuilding of its stack and work is to commence shortly.

The annual meeting of the Baldwin Locomotive Works will be held March 7.

WARWICK'S REPORT

For Year Notes Lease of Properties To Eastern Steel Co.

The report of the Warwick Iron & Steel Co., Pottstown, Pa., for the year ending Dec. 31 last, has just been published. Note is made of the lease of the company's properties to the Eastern Steel Co.

The balance sheet as of Dec. 31, shows the following:

ASSETS.

Cash	$ 79,000.45	
Accts. receivable, etc.	516,438.79	
Raw materials, etc.	776,021.48	
		$1,371,460.72
Real estate, plant, etc.	$2,284,864.97	
Additions for year:		
"A" furnace	117,306.92	
Elec. unit, etc.	17,899.44	
		$2,420,071.33
		$3,791,532.05

LIABILITIES.

Accts. payable	$ 548,817.52	
6 per cent notes	300,000.00	
	$848,817.52	
Gen. repairs, etc.	198,901.16	
		$1,047,718.68

CAPITAL AND SURPLUS.

Capital stock	$1,499,715.00	
Balance Jan. 1, 1911	1,221,209.27	
Earn. for year	156,252.54	
Int. on bonds	30,688.25	
Net earnings	125,564.29	
	$1,346,773.56	
Accts. charged off	17,297.61	
	$1,364,071.17	
Dividends	119,972.80	
	$1,244,098.37	
		$2,743,813.37
		$3,791,532.05

President Edgar S. Cook thus reviews the year's accomplishments:

Business conditions during the year 1911 were poor, and gradually grew worse. The average selling price of iron during the year declined, particularly in the last three months, so that the orders on our books Dec. 31, were $1.36 per ton lower than orders on the books Jan. 1, 1911. The cost of iron could not be materially reduced, and therefore the net profit per ton of iron made, is less than in the year 1910.

No. 1 furnace was in operation the entire year. No. 2 furnace was blown out April 7, 1911, after having made a total product for the blast, of 464,434 tons. It was put in operation again July 27, 1911. No. 3 furnace was not operated. For the year, our total product was 197,058.05 tons.

On June 1, 1911, bonds, amounting to $180,000, were paid and cancelled. At the same time we reduced our outstanding bank loans, to the extent of $120,000. This was accomplished by the issuing of $300,000 6 per cent gold notes, due June 1, 1914. Our furnace plant, therefore, is now free from all mortgage encumbrance. The construction of furnace stack "A", is practically completed, and will be ready for use as an alternate stack whenever needed. A 4 per cent dividend was paid on May 15, and also 4 per cent on Nov. 15, amounting to a total of $119,972.80. The net earnings for 1911, as per balance sheet attached, are $125,564.29.

The lease, with option of purchase, of your plant, to the Eastern Steel Co., as unanimously ratified at the stockholders' special meeting, held Jan. 16, is now in effect. The transfer was made as of Jan. 1. The consummation of this lease practically assures an 8 per cent dividend, and a cash valuation for the stock of $13.33.

Will Discuss Manufacturing by Electricity

The regular monthly meeting of the Engineers' Society of Western Pennsylvania, which is ordinarily held the third Tuesday of the month, has been postponed until Saturday, Feb. 24. This is done in order to take advantage of the visit to Pittsburgh of Dr. J. W. Richards, secretary of America Electro-Chemical Society and also professor of metallurgy at Lehigh university. Dr. Richards will present a paper on "Electric Furnace Manufacture of Pig Iron and Pig Steel." Dr. Richards has a thorough knowledge of electric furnace construction and operation. Last year he re-visited Norway and Sweden and made special investigation of the works of the electric furnace, in operation there. In 1910 he visited this country and at that time they were just beginning to build commercial plants of this character. His visit last fall was for the purpose of seeing the practical results of the working of these producers. The society is extending an invitation to engineers to attend this meeting. It will be held in the assembly room of the Oliver building, 8 p. m., Feb. 24.

Is Elected President

Robert P. Lamont has been elected president of the American Steel Foundries, Chicago, succeeding William V. Kelley, who has been made chairman of the board of directors, a place recently vacated by E. H. Gary. Mr. Lamont has been first vice president of the Steel Foundries since the combination with the old Simplex Railway Co., developed by him and Mr. Kelley. Stockholders will have their annual meeting in New York, March 21.

No. 3 blast furnace of the E. & G. Brooke Iron Co., at Birdsboro, Pa., will be blown out about Feb. 15. A falling off in the sale of pig iron is given as the reason for the closing down of the stack.

SUBSTANTIAL INCREASE

In Steel Corporation Bookings, But New Business Was Lighter.

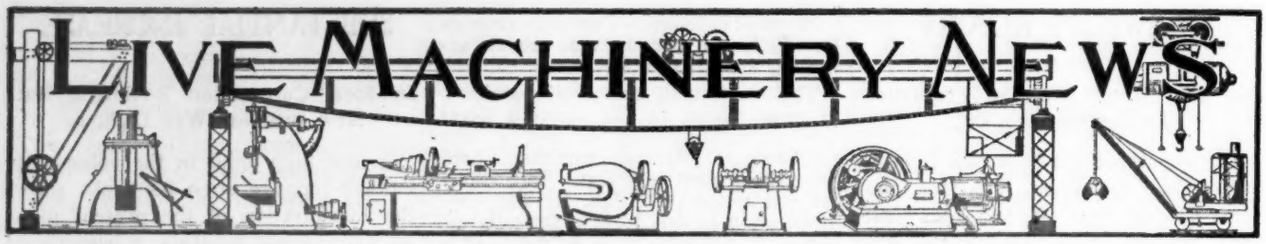
A new high point in the volume of unfilled tonnage upon its books since the inauguration of the present plan of announcing monthly a statement of orders awaiting manufacture, was reached by the United States Steel Corporation in January. During that month, the volume of business accumulated by the leading interest increased 294,960 tons, or 5.71 per cent, to a grand total of 5,379,721 tons according to the announcement made public Feb. 10. On Jan. 1, the unfilled tonnage was 5,084,761. Compared with the tonnage figures announced quarterly prior to the adoption of the monthly statement, the orders on hand are the largest since the end of the first quarter in 1910.

In view of the very active mill operations and shipments against contracts by the Steel Corporation in January, the showing of the past month is favorable. It is indicated, however, that new business was entered at the average rate of about 50,000 tons daily, which compares with an average exceeding 70,000 tons daily in December, the heaviest month in bookings of the past year. At the beginning of February the Corporation was operating at its highest rate of manufacturing activity in the recent buying spell and on the basis of the past month's bookings a smaller increase in unfilled tonnage will probably be disclosed as of Feb. 29.

Since the plan of making monthly statements of unfilled tonnage has been followed by the Corporation, the statements of business on hand, the tonnage and percentage of increase or decline from the previous month, have been as follows:

Date.	Total.	Change, tonnage.	Change, per cent.
Jan. 31, 1912	5,379,721	294,960+	5.71+
Dec. 31, 1911	5,084,761	942,806+	23.24+
Nov. 30, 1911	4,141,955	447,627+	12.06+
Oct. 31, 1911	3,694,328	83,011+	2.25+
Sept. 30, 1911	3,611,317	84,668—	2.34—
Aug. 31, 1911	3,695,985	111,900+	3.33+
July 31, 1911	3,584,085	223,027+	7.16+
June 30, 1911	3,361,058	247,871+	7.96+
May 31, 1911	3,113,187	105,617—	3.28—
Apr. 30, 1911	3,218,704	228,597—	6.63—
Mar. 31, 1911	3,447,301	46,758+	1.37+
Feb. 28, 1911	3,400,543	289,624+	9.31+
Jan. 31, 1911	3,110,919	436,162+	16.30+
Dec. 31, 1910	2,674,757	85,656—	3.09—
Nov. 30, 1910	2,760,413	111,536—	3.88—
Oct. 31, 1910	2,871,949	286,157—	9.12—
Sept. 30, 1910	3,158,106	379,088—	10.74—
Aug. 31, 1910	3,537,128	433,803—	10.92—
July 31, 1910	3,910,931	286,863—	6.72—
June 30, 1910	4,257,794	.....	....

The Beaver Dam Foundry Co., gray iron, has resumed operations after a two-weeks' shut-down for overhauling, repairs and inventory.



Considerable closing on old machine tool inquiries was done in the New York market last week, the chief buyers being the two leading manufacturers of electrical machinery. Several other interests, including western railroads, also contributed to the total of business booked. Many new inquiries have recently been submitted to the New York trade, chief of them being a large list of general shop equipment to be exported to Japan. There has been much activity in the purchase of cranes and hoists of late and manufacturers of these machines report satisfactory bookings. In Pittsburgh, an improvement in inquiries is reported, but this has not yet reached the closing stage. Plans for a large amount of new electric power development in that section are now under way and it is expected that a good demand will result for this class of machinery. In Cleveland, much proposed new work is being held up indefinitely and business in the machinery field continues at about 60 per cent of what was once regarded as normal. In Chicago, the market has an easier tone; sales of power and transmission machinery and equipment are good and improvement is noted in the machine tool branch.

Machine Tools

The High Point Motor Car Co., High Point, N. C., is in the market for a complement of machine tools to be installed in its repair shop. George Wilson is manager of the company.

The J. D. Bridges Co., Florence, S. C., is equipping a shop for the manufacture of automobile parts. Machine tools and other machinery will be purchased. J. D. Bridges is president of the company.

The board of education of Lexington, Ky., is in the market for six lathes to be installed in the manual training department of the high school. An appropriation of $900 has been made for the purchase.

The board of education of Louisville, Ky., will purchase additional machinery for the machine shop and forge-room of the manual training high school. Sam D. Jones, business director, is now preparing specifications.

The General Electric Co. has placed orders on about $10,000 worth of tools for its shops at Syracuse, N. Y., and the Westinghouse Electric & Mfg. Co. has bought between $12,000 and $15,000 worth for its plant at Newark, N. J. Both these purchases were made in the New York market.

Water Works

G. D. Holliday and others are planning the construction of a water plant at Berea, Ky.

A company is being organized at Campbellsville, Ky., to take over the electric light plant and build a system of water works. Definite plans are now being worked out.

Bids will be received by the city council of Newcastle, Ind., until Feb. 19, for one 3,000,000-gallon pumping engine and accessories. Charles Brossman, Union Trust building, Indianapolis, is consulting engineer.

The city of Altamont, Ill., will receive bids about May 1 for new pumps for the city water system. Details may be obtained from the Fuller-Coult Co., consulting engineer, Chemical building, St. Louis.

Edward E. Wall, superintendent of waterworks, St. Louis, advises that the city is considering improvements to its water system, including new boilers to cost $30,000 and new pumps to cost $275,000.

Estimates will be asked by the city of Pittsburgh this month for the construction of a reservoir of 150,000,000 gallons capacity, in Shaler township, estimated to cost $1,000,000; for a new brick pumping station, 120 x 180 feet, at Aspinwall; for pumping equipment of 100,000,000 gallons daily capacity, estimated to cost $250,000, and for a 30-inch steel raising main, 7,000 feet long, for the Southside district, to cost about $80,000.

Power Plant Equipment

Macksville, Kan., expects to install a municipal electric light plant.

Atchison, Kan., is considering the construction of a municipal electric light plant.

The Merle & Heaney Mfg. Co., 215 Washington street, Chicago, expects to erect a boiler plant at 2221 So. Union place, to cost about $15,000.

Newton, Ia., expects to install four new boilers at its municipal electric light plant. C. O'Leary is chief engineer.

The city of Chillicothe, Mo., is considering extensions to its municipal electric light plant to cost approximately $10,000.

The city of Pulaski, Tenn., is to install a new electric light plant and is now sending out specifications on the machinery.

The 72-inch x 18-foot tubular boilers, together with feed pumps, etc., will be installed at the Evanston hospital, Evanston, Ill. F. S. Richmond, Fisher building, Chicago, is consulting engineer.

Thomas Nugent, president of the Elnora Electric Co., Elnora, Ind., announces that bids will be received for the installation of an electric light and power plant at Elnora. Details have not been given out.

Bids will be received soon by the Indiana Life Insurance Co., Indianapolis, for the installation of an electric light, heat and water plant in the basement of a new eight-story office building.

The Munfordville Milling & Lumber Co., Munfordville, Ky., is in the market for a 100-horsepower boiler and machinery for milling corn. The company was recently incorporated. A. R. Spencer is president.

The Longmont Service Co., Longmont, Colo., has been organized with a capital of $50,000 to furnish electric power in Boulder, Larimer and Weld counties. Asa D. Holt, John Andrew, M. A. Rowen and others are among the incorporators.

The Oro Water, Light & Power Co., San Francisco, Cal., has acquired the properties of the Butte & Tehama Power & Irrigation Co., and the Sierra Irrigation Co. The new organized company plans to build a generating plant at Mill Creek, Cal.

Bids will be received by the city council of Garrett, Ind., until Feb. 13, for furnishing and installing one steam engine driven generator unit of 150 kilowatts capacity, three-phase, 2,300-volt, 60-cycle, 200 revolutions per min-

ute, with the necessary switch board, exciter and other auxiliaries.

The Pennsylvania Power Co., operating in Lawrence county, Pa., supplying the boroughs of West Pittsburgh, Ellwood City, and adjacent towns, is securing a franchise, with the intention of extending its lines and increasing its power equipment in that section.

Boilers and other equipment will be required by the Forest Products Chemical Co., Memphis, Tenn., which has been organized with $100,000 capital stock for the purpose of developing the by-products of the waste of lumber mills. James Lawrence is general manager of the company.

The Ashland Leather Co., Ashland, Ky., has completed plans for its new buildings to take the place of those destroyed by fire. A new power plant will be erected. Electrical machinery will be used. The motors will be operated by a 150-horsepower engine and a 100-kilowatt generator. T. J. Shaut is president of the company.

The Belmont - Quemahoning Coal Co., Youngstown, O., is driving in new stope into its property on Quemahoning creek, near Ashtola in Cambria county, Pa.; and is to build a new tipple with automatic crossing over dump and single rope haulage, and also a bridge over the Quemahoning creek to railroad tracks. The work is in charge of C. S. Collins, local engineer of the company.

The Battle Island Co., Neenah, Wis., is understood to have authorized an issue of $100,000 in bonds for the purpose of acquiring a dam site and 3,500 acres of flowage land on the Wisconsin river, near Knowlton, Wis. The company proposes to erect a hydro-electric plant at this point to develop a minimum of 2,400 horsepower. A transmission line is proposed to Neenah, 72 miles, and also to Oshkosh and Fond du Lac.

Applications for charters for the incorporation of the Bethel Electric Co., to supply heat and power in Bethel township, Allegheny county, Pa., and for the Scott Electric Co., to supply heat and power in Scott township, Allegheny county, Pa., will be made on March 4, at Harrisburg, Pa., with W. W. Murray, Chas. A. Lambie, Walter P. Rainbow as incorporators. The incorporators are residents of Pittsburgh.

Application for charters for the Concord Electric Co., to operate an electric light and power plant in lower St. Clair township, Allegheny county, Pa., with Jos. H. Jenkins, F. N. Barber and A. C. Meheard as incorporators, also for the Knoxville Light & Power Co., to operate in the borough of Knoxville, Allegheny county, Pa., with J. F. Grimes, J. P. Moore and J. B. Caupfield as incorporators and for the Baldwin Electric Co. to supply heat, light and power in Baldwin township, Allegheny county, Pa., with Jos. A. Jenkins, F. N. Barber and C. B. Meheard as incorporators, will be made in Harrisburg, March 4. The incorporators are residents of Pittsburgh.

New Construction

The Palmetto Iron Works, Greenville, N. C., will erect a brick foundry, 40 x 117 feet.

S. L. Williams & Son, Greeneville, Tenn., will erect a foundry and machine shop.

The Day Automobile Co., St. Louis, is said to be planning a large addition to its plant.

The Strickland Machine Co., Richmond, Va., will erect a one-story machine shop, to cost about $8,000.

H. O. Davidson, architect, Caxton building, Cleveland, is preparing plans for a two-story machine shop, 45 x 75 feet.

The village of Luxemburg, Wis., is considering a proposal to establish an electric lighting system to cost $4,000.

Plans are being completed by the Canadian Locomotive Works for its proposed plant extension at Kingston, Ont.

McNey & Duff, Terrell, Tex., are planning to establish a foundry, 40 x 80 feet; a machine shop, 32 x 80 feet; a blacksmith shop, etc., at Temple, Tex.

The Aluminum Co. of America, New Kensington, Pa., will expend about $100,000 in improvements to its St. Louis plant. Orders for some of the equipment have already been placed.

C. O. Prowse, Hopkinsville, Ky., has organized a company with $20,000 capital stock for the manufacture of aeroplanes. The factory will probably be located at Nashville, Tenn.

The Riverside Portland Cement Co., Riverside, Cal., advises that it expects to do very little construction work this year, and certainly will not expend $225,000, as reported.

The Geo. J. Meyer Mfg. Co., 576-584 Clinton street, Milwaukee, manufacturer of boilers, etc., is considering the project of erecting a new plant this year. No definite plans have been prepared.

The Nyberg Automobile Works, Chattanooga, Tenn., is planning the immediate erection of a motor car factory and is operating temporarily in another building. Henry Nyberg is head of the company.

Improvements in the plant of the Ohio Valley Pulley Works, Maysville, Ky., are being made. The concern, which has been doing business for a number of years, was recenty incorporated with $50,000 capital stock.

The General Fireproofing Co., Youngstown, O., increased its capital stock on Feb. 6 from $900,000 to $1,000,000. It will at once begin preparations for a four-story addition to its metal furniture department.

The C. G. Garrigus Machine Co., Bristol, Conn., manufacturer of stamping, blanking and special machinery and tools, advises that its proposed addition is to be three stories, 26 x 40 feet. A new boiler house, 25 x 45 feet, is also to be erected.

The International Hoist Co., Antigo, Wis., manufacturer of gasoline engines, motors, etc., has decided to sell the remainder of its stock in treasury for the purpose of building a new plant. About $20,000 will be raised in this manner.

New equipment will be installed at once by E. B. Miller, Central City, Ky., whose foundry and machine shop was burned recently. The loss was $10,000, covered by insurance. The concern has been operated as the Central City Foundry & Machine Co.

The J. S. Rowell Mfg. Co., Beaver Dam, Wis., manufacturer of agricultural implements, has increased its capital from $100,000 to $300,000, part of the new issue to be used for extending the work. No definite plans have been announced.

The Chicago, Milwaukee & St. Paul railroad proposes to enlarge its roundhouse and install a mechanical coaling station at Perry, Ia., and the Kansas City Southern railway is considering the erection of new shops at De Quincy, La.

The Fulton Machine & Vise Co., Lowville, N. Y., manufacturer of machinists' vises and centrifugal pumps, advises that it expects to erect a building this year but it is not yet prepared to give out information as to the size or other details.

The Kanawha Mine Car Co., Charleston, W. Va., manufacturer of mine cars, plans to erect two additions to its plant. They will include a two-story building, 60 x 110 feet, and a one-story building, 55 x 58 feet. A number of motors and cranes will be required.

The Buckeye Iron & Brass Works, Dayton, O., is having plans prepared for a six-story and basement factory building. Schenck & Williams, architects, Dayton, will take bids on the structure early this spring. C. E.

Pease, 326 East Third street, Dayton, is interested in the Buckeye company.

The John A. Rowe Cut Stone Co., Bedford, Ind., the plant of which was recently destroyed by fire with $25,000 loss, will rebuild at once, and is asking for quotations on the necessary equipment. John A. Rowe is head of the concern.

Henry Nyberg, of the Nyberg Automobile Works, Chattanooga, Tenn., is organizing a company for the manufacture of a moderate priced automobile. C. E. James, John A. Patten and others are interested in the concern, which will incorporate in the near future.

The Ellicott Machine Co., Baltimore, has purchased a portion of the old Quarantine hospital site, Baltimore, and plans to erect three one-story buildings: An office building, 50 x 50 feet; factory, 50 x 100 feet; power plant, 50 x 50 feet. The concern manufactures dredges.

Bertsch & Co., Cambridge City, Ind., advise that contract for the buildings in their new plant has been let and that they will probably be in the market for a small amount of equipment, although at the present time plans are not complete. This company manufactures machinery for plate and boiler shops.

H. Ley & Co., Harrison avenue and the Baltimore & Ohio railroad, Cincinnati, advise that they are about to erect a new plant on Lincoln avenue and the Cincinnati, Lebanon & Northern railroad, that city, but are not ready to make an announcement regarding the equipment which will be required.

In his annual report to the stockholders of the American Can Co., President Graham announced that the company is considering the construction of two new factories on the Pacific coast, one at Chicago and a new warehouse at New Orleans. Rearrangement of the American Stopper Co.'s plant in Brooklyn, N. Y., is also under advisement.

The Automatic Sprinkler Co. of America, 123 William street, New York, is contemplating the erection of a large plant at Akron, O., or Pittsburgh. Plans are in the hands of Dodge, Day & Zimmerman, Drexel building, Philadelphia, and full details will be announced after the location has been definitely decided this month. Sites have been optioned in both cities.

James R. Harris, general manager of the Busch-Sulzer Bros. Diesel Engine Co., St. Louis, advises that this concern expects to build a large plant in St. Louis for the manufacture of Diesel engines and has engaged the Arnold Co., of Chicago, as consulting engineer. The plant will probably cost about $1,000,000. As soon as certain streets are vacated which are necessary to complete the site, grading will be commenced and the plant pushed to completion as rapidly as possible.

Miscellaneous

C. L. Ritter, of the Ritter Lumber Co., Huntington, W. Va., who is one of the principal stockholders of the recently organized Turkey Foot Coal & Lumber Co., states that the company will erect a saw mill at Louisville, Cincinnati or some other Ohio river point. Logs will be brought down from the timber holdings of the company in Jackson county, Ky., by the Kentucky river.

Contracts are being awarded by the Ohio Valley Electric Railway Co., for the enlargement of its power plant at Kenova, W. Va. The company has awarded to the Wheeling Engineering & Condenser Co., Wheeling, a contract for the installation of condensing apparatus to include a rectangular jet condenser for 1,500-kilowatt and 2,000-kilowatt steam turbine, a rotary dry air vacuum pump, and 100-horsepower centrifugal tail pump.

Orders placed with the Westinghouse Electric & Mfg. Co. for the closing days of January included the following:

The Edison Electric Illuminating Co., Brooklyn, seven 1,350-horsepower, 270-volt rotary converters and 21 450-horsepower, air blast type transformers. This is a duplicate of an order received some months ago from the same concern.

The New York Edison Co., two 4,000-horsepower, 270-volt rotary converters, five 4,600-horsepower rotary converters and nine air blast type transformers. The 4,000-horsepower rotaries are of the vertical type. All of the rotary converters are of the newly designed synchronous booster type.

The Long Island railroad, two 2,000-horsepower and two 2,700-horsepower rotary converters, with a complete equipment of 33,000-volt transformers, for use in operating trains at the new Pennsylvania terminal in New York City.

The Snow Steam Pump Works has been awarded a contract for a 12,000,000-gallon horizontal, cross-compound, condensing, opposed-type, water pump, to be installed at Flint, Mich., for the sum of $24,200. The Dravo-Doyle Co. has been awarded the contract for three low service pumping units, each consisting of one 12-inch, double-suction, horizontal De Laval pump, direct connected to a 55-horsepower, De Laval steam turbine for the same plant, at a total price of $5,125, and the P. H. & F. M. Roots Co., Connersville, Ind., was awarded contract for one No. 3 blower at $897. All other bids were rejected. William G. Clark, consulting engineer, Toledo, O., is in charge of the installation.

Government News

The bureau of supplies and accounts will receive bids to March 12 for 10 motors, under schedule 4356, for delivery at Brooklyn, N. Y.

Bids were received Jan. 24, by the United States Reclamation Service (Boise project) at Los Angeles, Cal., for furnishing 12 out-door transformers, including one extra primary coil and one extra secondary coil, as follows:

Allis-Chalmers Co., Los Angeles, $2,045, delivery East Norwood, O.; Crocker-Wheeler Co., Los Angeles, $2,052, delivery Ampere, N. J.; Wagner Electric Co., Los Angeles, $2,136.50, delivery St. Louis, Mo.; Westinghouse Electric Co., Los Angeles, $2,150, delivery East Pittsburgh, Pa.; General Electric Co., Los Angeles, $2,160, delivery Pittsfield, Mass.

The bureau of supplies and accounts, navy department, opened bids on Feb. 6 for furnishing four convertible, steel-plate fans, direct-connected to a 120-volt, direct-current, inclosed type motor, complete with controlling appliances, for delivery at Brooklyn, N. Y., under schedule 4261, class 61, as follows: Dunlap Mfg. Co., Columbus, O., $495.80; General Electric Co., Schenectady, N. Y., $530; B. F. Sturtevant & Co., Hyde Park, Mass., $463; Western Electric Co., New York, $451.10.

Contracts have been awarded by the bureau of supplies and accounts, navy department, for furnishing materials and supplies to be delivered to the naval stations named, in accordance with the schedules enumerated, under bids opened on the days indicated, as follows:

Opening Oct. 31.

Schedule 4005, class 124, Philadelphia, one radial three-spindle boiler plate drill: Manning, Maxwell & Moore, New York, $6,800.

Opening Jan. 2.

Schedule 4147, class 61, alternate bid, Norfolk, Va., two double-ended boilers, horizontal cylindrical return fireproof type, 4,812 square feet, total heating surface: Babcock & Wilcox Co., New York, $15,900.

Schedule 4148, class 62, Puget Sound, one set water-tube boilers: Babcock & Wilcox Co., New York, $18,400.

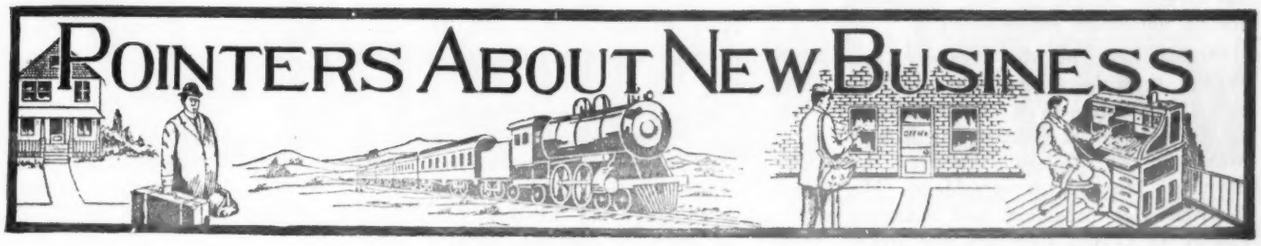
Proposals will be received by the United States Reclamation Service, department of interior, Fallon, Nev., Feb. 26, for furnishing and delivering f. o. b. shipping point one electric power shovel.

Proposals will be received by the isthmian canal commission in accordance with circular 681, to be opened March 8, for furnishing materials and supplies, to be delivered at the isthmus, as follows:

Class 1. 18 motors for guard-valve machine, 80 motors for hand rail mechanism, 80 hand rail gearings, 22 motors for spillway gate machines.

Class 2, miscellaneous pumps and motors for same.

Class 3, 149 float switches, 149 automatic starters and 10 starters for compensators.



New Buyers

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

The following manufacturing companies have filed articles of incorporation:

Atlanta Switch Co., Atlanta, Ga.; $250,000; by Thomas C. Biggs, Roscoe F. Bishop and Paul Voss.

Texas Bridge Co., Dallas, Tex.; $50,000; by M. S. Hasie Jr., I. Frenkel and L. S. Leversedge.

The H. H. Bain Sheet Metal Works, Shreveport, La.; $50,000; by H. H. Bain, A. R. Holliday and J. S. Burch.

Southern Foundry & Machine Co., Lexington, Tenn.; $10,000; by A. E. Beasley, C. G. Gathings, T. A. Lancaster, John S. Fielder and others.

The American Compensating Valve Co., Manitowoc, Wis.; $10,000; by S. D. Eckel, C. A. Zeman and L. A. Slupecky.

Beauharnois Machinery Co., Ltd., Montreal, Can.; $250,000; to engage in business as machinery agents; by Arsone Legault and others.

Hercules Motor Trucks, Ltd., Montreal, Can.; $50,000; to deal in automobiles, etc.; by A. G. F. Ross, H. S. Ross, V. S. Ross and others.

The Milwaukee Milling Machine Co., West Allis, Wis.; $5,000; by Edward J. Kearney, Theodore Trecker and Mackey Wells.

The Peterborough Model Foundry & Mfg. Co., Ltd., Peterborough, Ont.; $40,000; by provisional directors, Thomas H. Ruble, John Condon, Wm. H. Pethick and others.

Differential Axles, Ltd., Toronto, Ont.; $2,000,000; to manufacture railway equipment; by provisional directors, Isidore F. Hellmuth, John R. Meredith, E. C. Cattanacle and others.

W. H. Colby, Chattanooga, Tenn.; $25,000; to manufacture mechanics' tools, etc.; by W. H. and S. B. Colby, A. M. January, E. B. Clark and J. Forwalter.

Perfection Cooler Co., Ltd., Toronto, Ont.; $50,000; to manufacture water coolers and metal and fiber wares; by provisional directors, Thos. G. Wells, James J. May, Frank R. Smith and others.

Birmingham Metal Products Co., Birmingham, Ala.; $35,000; to manufacture corrugated metal culverts of spiral locked joints, corrugated tanks, cisterns, garbage cans and other metal products; by Solon Jacobs, J. H. Dean and H. O. Bernard.

The M. E. Bertram Engine Co., Cleveland; $30,000; to manufacture gas engines for automobiles, motorcycles, motorboats, aeroplanes, etc.; by H. E. Bertram, Alfred A. Guthrie, K. C. Smith, L. W. Kelley, A. C. Wallace.

The Bac-2-lite & Automatic Switch Co., Dayton, O.; $30,000; to manufacture automatic switch lights for automobiles, vehicles and boats; by Rodney W. Martin, Townsend S. Jordan, Opal M. Martin, Morris Wetzel and James C. Martin.

General Industrial

The American Scale & Tank Co., of Anderson, Ind., whose plant was destroyed by fire a short time ago, will move to Hamilton, O., having secured the buildings of the former MacNeale & Urban Safe Co.'s plant at that place.

The New England Vending Machine Co., New Haven, Conn., recently incorporated as a manufacturer and jobber of automatic vending machines, advises that it is having its machines made on contract and does not intend to build at this time.

The Eagle Casting Co., of Winchester, Ky., has been reorganized, C. E. Gibbens purchasing the controlling interest in the company. F. G. Cornell will continue as superintendent of the plant.

The Mauston Aluminum Co. has been organized at Mauston, Wis. Articles of incorporation have been filed and a charter granted. The capital stock is $16,000 and the promoters are J. L. Marvin, W. F. Mensor and M. L. Bunnell.

The Simplex Mfg. Co., Anderson, Ind., recently incorporated, advises that it will manufacture a mechanical starter for automobiles and that its capacity will be 50,000 starters per year. The concern already has its plant and equipment.

The Evans Mfg. Co., Inc., Hannan, N. Y., whose factory and machinery was recently entirely destroyed by fire, advises that it is settling up the company's affairs as rapidly as possible and at the present writing is not in a position to disclose the company's future plans.

The Busch-Sulzer Bros.-Diesel Engine Co., St. Louis, which recently purchased a site for the proposed engine works at St. Louis, has engaged the Arnold Co., of Chicago, to assist in constructing the works. It advises that at present it is at work on its preliminary plans.

The Penn Metal Co., successor to the Penn Metal Ceiling & Roofing Co., 201 Devonshire street, Boston, advises that its output will be fireproof building materials made from sheet steel. Its factory buildings contain 20,000 square feet of floor space.

The Connecticut Computing Machine Co., New Haven, has been placed in the hands of the Union & New Haven Trust Co. as temporary receiver. The heavy expense of experimenting is said to have caused the suspension. Steps will be taken to wind up the concern.

The Hartman-Greiling Co. is the corporate name of the consolidation of several important boiler and machinery interests at Green Bay, Wis. The authorized capital is $75,000 and the incorporators are: Carl Hartman, Herman Greiling, Charles Greiling and Louis H. Barckhausen.

The Cleveland Motor Truck Mfg. Co., with offices on the sixth floor of the New England building, Cleveland, is completing arrangements to take over and operate a plant in another locality. The company manufactures a four-wheel drive motor truck.

Reorganization of the Billings Foundry & Mfg. Co., Billings, Mont., was effected at the recent annual meeting. F. E. Huddleson, formerly of Muskegon, Mich., was named manager, succeeding J. C. O'Donnell, who has disposed of his interest. The president of the company is I. D. O'Donnell.

The Henry Wright Mfg. Co., Hartford, Conn., maker of sensitive and radial drilling machines, has purchased the plant of the Parker Motor Co. and expects to move into it by March 1. Practically no new machinery or equipment will be purchased, as the company

has already bought all that is needed for its immediate requirements.

Stockholders in the Leader Iron Works recently elected these directors: W. A. Shorb, R. E. Pensinger, W. C. Field, T. E. O'Brien and Robert Mueller. The board organized by electing Mr. Shorb president, Mr. O'Brien vice president and manager and A. G. O'Niel secretary and treasurer.

The property of the Standard Machinery Co., Chattanooga, Tenn., which concern has been in the hands of receivers, has been sold at auction, for a figure somewhat in excess of $10,000, to the American Mfg. Co. R. H. Hart, formerly connected with the Standard company, announces that he will re-enter the business.

Stockholders of the Chapman Valve Mfg. Co., Boston, at their recent annual meeting, re-elected directors. The annual report for 1911 showed a net profit of $68,106 and surplus after dividend payments of $54,030, an increase in the year's surplus account of $43,356. Orders on hand assure fair prospects for the year.

The Racine Electric Co., Racine, Wis., incorporated for $10,000, is installing machinery and equipment in its plant at 1819-1825 Douglas avenue, and expects to begin operations about Feb. 10. Tolf Tolfson, John Rugaber and William Nelson are the promoters of the company and its active heads.

The Globe Malleable Iron & Steel Co., Syracuse, N. Y., the destruction of whose foundry by fire was recently noted, announces that arrangements are now under way for rebuilding the foundry. The plans are not yet completed but a plant will be built as nearly fireproof as possible.

The McIntosh & Seymour Co., Auburn, N. Y., advises that it was incorporated to carry on the business of McIntosh, Seymour & Co. in the building and selling of steam engines and other power plant equipment. No new building will be done and no additional equipment is required.

The Unit Weighing & Packing System, Continental building, Baltimore, recently incorporated with $750,000 capital stock, plans to manufacture and sell automatic weighing and packing machines for use in connection with powdered or granular substances. Lewis M. Keizer is president.

The Ludlow-Saylor Wire Co. stockholders, at the annual meeting in St. Louis, elected these officers and directors: President, William Duncan; vice presidents, G. Duncan, F. Low and E. J. Gould; secretary, Duncan Meier; directors, these officers, together with H. M. Meier, Leslie Danna and Charles L. Dean.

The Thermo-Stove Co., Plainfield, N. J., recently incorporated, advises that it will make gas, electric and alcohol stoves of the "fireless" type, for both cooking and heating purposes. It may be several months before manufacturing operations are begun. The equipment will be limited, stamping machinery to be the principal item.

The Frost Engine Co., Evansville, Wis., advises that it will manufacture gasoline engines in one-horsepower size only and also do machine work in the line of jobbing, developing and perfecting patents for the market. It does not expect to build this coming year. The equipment has been purchased and the company will be able to turn out 15 engines a week.

The Racine Mfg. Co., Racine, Wis., manufacturing automobile bodies, parts and specialties in metal and wood, has voted to increase its directors from three to seven. The company suffered the destruction of its entire plant in December, 1910. Since then a plant nearly double in size has been erected but further space is needed. The company is capitalized at $800,000.

The Central Iron & Metal Co., Chicago, has located its main office and yard at Thirty-seventh and Rockwell streets, that city, and is installing a derrick, four shears and a railroad track scale at the new location, which is on the Chicago & Alton railroad. The concern is now in a position to handle any quantity and quality of scrap. The old yard at Canal and Lumber streets will continue to be used for storage.

The remaining machinery, book accounts, etc., of J. P. Lindemann & Sons, stove manufacturers, Milwaukee, were sold at public auction by E. E. Smythe, trustee. The machinery consisted mainly of junk, as the plant was destroyed by fire several months ago. The destruction of the plant resulted in the bankruptcy proceedings. This firm was in no way connected with the A. J. Lindemann & Hoverson Co., Milwaukee, manufacturing stoves and ranges.

The Convertible Ratchet Wrench Co., Allentown, Pa., has been recently incorporated for the manufacture of convertible ratchet wrenches. Space has been leased with the Sprague Machine Co. and considerable machinery has been installed for the production of drop forgings and other material, which will be furnished to the machine company for the manufacture of wrenches. Some plant construction may follow in the near future. Harvey J. Wieand is president.

Trade Notes

The Firth-Stirling Steel Co., McKeesport, Pa., has opened an office at Sixteenth and Connecticut streets, San Francisco, in charge of E. O. Reynolds.

The George M. Newhall Engineering Co., Philadelphia, has opened new offices at 807-8-9 Morris building, that city. This concern also maintains an office at 50 Church street, New York, and storage yards at Williamsport, Pa.

Kilburn D. Clark, who has for the past five years represented the Harbison-Walker Refractories Co., in New York state and Canada, has secured the representation in the same district for the General Refractories Co., manufacturer of high-grade fire brick, silica, magnesia and chrome brick, fire clay, silica cement and importers of magnesite and chrome ore. Also the Brighton Fire Brick Co., manufacturer of several grades of fire brick. The main office will be 75 Erie County Bank building, Buffalo. Mr. Clark will handle everything in refractories.

Fires

A portion of the plant of the Oregon Iron & Steel Co., Oswego, Ore., was destroyed by fire recently, the loss being reported as $50,000.

The Standard Oil Co.'s car shops at Sugar Creek, Mo., were burned recently, entailing a loss of about $10,000.

The plant of the Huntington Stove Foundry Co., Huntington, W. Va., has been damaged by fire to the extent of several thousand dollars.

Fire at the Clarksburg Foundry & Casting Co.'s plant, Clarksburg, W. Va., caused damage to the extent of about $7,000.

Fire in the drop forge department of the Transue & Williams Co., Alliance, O., on Feb. 11, caused considerable damage to the machinery.

The plant of the Central City Foundry & Machine Co., Central City, Ky., owned by E. B. Miller, of that city, was damaged by fire recently, entailing a loss of about $10,000.

The plant of the Barnard & Leas Mfg. Co., Moline, Ill., manufacturer of flour milling machinery, was badly damaged by fire which broke out on Feb. 6. The loss was heavy.

Fire recently broke out in the plant of the Forge Wheel Co., at Lyndora, near Butler, Pa., the reported damage being $10,000. The concern is a subsidiary of the Standard Steel Car Co.